Configuration Management Handbook

International Space Station Alpha Program

June 30, 1995

National Aeronautics and Space Administration
International Space Station Alpha Program
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PREFACE

This Configuration Management (CM) handbook has been prepared to describe the CM functions and provide detailed procedures for use by Configuration Management Analysis and Integration Team (CMAIT) personnel and those offices supporting the International Space Station Alpha program. This handbook is not intended to be used as a contractual document. It is directed to procedures which will be followed by all Government and contractor personnel supporting the Space Station program.

The specific requirements for CM and change control are contained in SSP 41170, Configuration Management Requirements.

This handbook is under the control of the CMAIT. This handbook will be revised as required. Changes will be issued by replacement pages or by complete revision as appropriate.

/s/Arthur Bond	1/30/95	/s/N. E. Solvik	1/30/95
NASA Co–Chairman Configuration Mangement Analysis and Integration Team	Date	Boeing Co–Chairman Configuration Mangement Analysis and Integration Team	Date

INTERNATIONAL SPACE STATION ALPHA PROGRAM

CONFIGURATION MANAGEMENT HANDBOOK

JUNE 30, 1995

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INTERNATIONAL SPACE STATION PROGRAM

CONFIGURATION MANAGEMENT HANDBOOK

LIST OF CHANGES

JUNE 30, 1995

All changes to paragraphs, tables, and figures in this document are shown below:

ENTRY   **DATE**   **CHANGE**   **PARAGRAPH(S)**

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1.0 INTRODUCTION

1.1 PURPOSE

This Handbook defines the Configuration Management (CM) processes and procedures to be used in implementing the CM requirements which are outlined in SSP 41170, Configuration Management Requirements. These processes and procedures will be used to identify and establish configuration baselines and control changes to those baselines, as well as, implement and maintain other CM functions.

1.2 SCOPE

The CM procedures as defined by this Handbook, will be used by the prime contractor, all National Aeronautics and Space Administration (NASA) organizations participating in the International Space Station Alpha (ISSA) Program, other NASA contractors supporting the ISSA, and the International Partners.

1.3 APPLICABILITY

These procedures are applicable to the design and development phases of the program and will be modified, if necessary, to cover the operations phase.

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2.0 APPLICABLE DOCUMENTS

2.1 GENERAL

The documents of the exact issue shown form a part of this plan to the extent specified herein. Boeing documents are available through the Johnson Space Center (JSC) ISSA Library.

2.2 GOVERNMENT DOCUMENTS

DOCUMENT NO.	TITLE
DOD–D–1000B Notice 1, 1 Jul 90	Drawing, Engineering, and Associated Lists
DOD–STD–100C, Notices 1–6, 15 Mar 88	Engineering Drawing Practices
MIL–M–9868/1B 21 Dec 87	Microfilm of Engineering Documents, 35MM, Preparation of Roll
MIL–STD–130G 11 Oct 88	Identification Marking of U.S. Military Property
MIL–STD–480B 15 Jul 88	Configuration Control – Engineering Changes, Deviations and Waivers
MIL–STD–490 Notice 1–2, 18 Mar 72	Specification Practices
MIL–STD–1521B Notice 1, 19 Dec 85	Technical Reviews and Audits for Systems, Equipment and Computer Software
MIL–STD–2167A 29 Feb 88	Software Development
SSP 30459F 23 Mar 94	International Space Station Interface Control Plan
SSP 41170 Basic 23 Mar 94	Space Station Configuration Management Requirements
SSP 41171 Basic 23 Mar 94	International Space Station Alpha Program Preparation of Program–Unique Specifications
SSP 50010–01 July 94	Documentation Requirements, Standards and Guidelines Volume 1: Requirements and Standards
SSP 50010–02 Not Released	Documentation Requirements, Standards and Guidelines Volume 2: Guidelines

2.3 BOEING DOCUMENTS

D684–10002–1	Space Station Program Data Management Plan

D684–10018–1A (Draft) R2   Space Station Prime Contractor Interface Control Plan
2 Sep 94

D684–10044–1 Basic   Program Execution Plan (PEP)
1 Jun 94

D–30000   Engineering Operations Manual (EOM)

D–4900   Drafting Standards Manual (DSM)

3.0 CONFIGURATION MANAGEMENT FUNCTIONS

CM is a technical and management process that defines the ISSA allocated, functional, and product baselines, controls changes to those baselines, and provides status of the baselines. The CM process also provides support to reviews and audits of the configuration baseline identification.

3.1 CONFIGURATION IDENTIFICATION

Configuration identification is the task of describing the requirements for the configuration of all program hardware, software, and data; and the documentation of these requirements. Configuration identification for the program will be accomplished through the development of formal documentation, which will describe program baselines. Baselines will be developed through the Integrated Product Team (IPT)/Analysis and Integration Team (AIT) process with all affected Program and International Partner Manager concurrence on the baseline documentation prior to formal baselining and release. NASA program baseline will be established by a Change Directive (CD) from the Space Station Control Board (SSCB) or Space Station Analysis and Integration Team (SSAIT) NASA Chairman. The Prime internal baseline will be established by the approval level IPT by a CD.

3.2 CHANGE MANAGEMENT

Change management encompasses the requirements for controlling all changes to contractually authorized and internally controlled specifications, documents, drawings, associated lists and forms, and to the resultant hardware and software products. Change management provides direction for and surveillance of the following:

a. Change classification and format

b. Required authorization to proceed with any change

c. Adequate and timely review by all program functionals

d. Compliance with contractual requirements

e. Release and distribution

f. Change status accountability

g. Numbering system

3.3 CONFIGURATION ACCOUNTING/CONFIGURATION STATUS ACCOUNTING

3.3.1 CONFIGURATION ACCOUNTING

Configuration status accounting includes the maintenance of or access to complete and accurate historical records, from initial configuration through change incorporation and verification, on

the configuration status of all ISSA Configuration Items (CIs)/Computer Software Configuration Items (CSCIs) including Government–Furnished Equipment (GFE). It will also identify the authorized configuration (as–designed) and the actual configuration (as–built) for use in "as–authorized" versus "as–built" comparisons. It will assure that disparities are accounted for so that corrective action can be taken to bring the CI into compliance prior to delivery.

These records will be the responsibility of the design Prime contractor until NASA assumes control as authorized in the prime contract, and will be maintained by the design Prime contractor under sustaining engineering provisions as directed by NASA through completion of the contract.

3.3.2 CHANGE TRACKING AND ACCOUNTING

Change tracking and accounting includes the tracking and statusing of proposed changes to the technical baselines from initiation of a Preliminary Change Memo (PCM) by an IPT/AIT through change disposition and implementation. The Change and Commitment Tracking Information System (CACTIS) will be utilized by the Prime to accomplish this function.

3.4 ENGINEERING RELEASE

The Engineering Release Unit (ERU) will track, control, and release ISSA drawings and documents in accordance and compliance with requirements for documentation, drawings and their associated lists. It will provide a controlled archival system for all produced drawings and documents, including the maintenance of engineering release records.

3.5 BASELINE DOCUMENTATION MAINTENANCE

Maintenance of technical requirements and specifications identified to establish the ISSA functional, allocated, and product baselines will be accomplished by the responsible IPT/AIT or SSCB, as chartered in D684–10044–1, Program Execution Plan, by approval of a CD signed by the IPT/AIT or SSCB Chairperson. The CD will include a Document Change Notice (DCN), Specification Change Notice (SCN), or Interface Revision Notice (IRN), as appropriate, ready for release when authorized by CD approval, to update the baseline. Type A specifications will be prepared in accordance with the Prime Contract Data Requirements and baselined by the NASA Program Manager with a SSCB CD for inclusion in the Prime Contract as a contract technical requirement. NASA controlled documentation will be signed by the NASA Program Manager, or will reference the authorizing CD in lieu of obtaining a duplicate signatory. Type B and C specifications will be prepared in accordance with the Prime or Product Group (PG) Contract Data Requirements and baselined by the Prime Contractor for inclusion in the PG subcontracts as contract technical requirements. These NASA and Prime Contractor baselines will be established in a progressive manner to allow baselines to be controlled at the lowest possible level consistent with the major program milestones. The allocated and product

baselines will be elevated to NASA control, consistent with the Functional Configuration Audit (FCA)/Physical Configuration Audit (PCA) milestones and end item acceptance.

3.6 DESIGN REVIEWS AND AUDITS

Design reviews and configuration audits will be conducted incrementally as required to meet design requirements. Requirements reviews, design reviews, FCAs and PCAs will be conducted on all deliverable CIs/CSCIs per Program plans and schedules, to ensure requirements flowdown and implementation. These reviews and audits establish baselines for further development and verify the design approach.

CM audits will be conducted periodically to assure CM processes are in accordance with SSP 41170, Configuration Management Requirements. These CM audits will be conducted on the Prime, Product Groups, other ISSA program NASA contracts, and NASA program participants.

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4.0 CONFIGURATION MANAGEMENT ANALYSIS AND INTEGRATION TEAM RESPONSIBILITIES

Management of the overall CM system is conducted by the Configuration Management Analysis and Integration Team (CMAIT), which establishes and coordinates overall CM requirements and policies. The CMAIT is chartered by D684–10044–1, Program Execution Plan, section 6.0. The CMAIT is co–led by NASA and the Prime Contractor and includes representatives of each Program participant as follows:

a. Manager, PG–1 Space Station CM (McDonnell Douglas)

b. Manager, PG–2 Space Station CM (Rocketdyne)

c. Manager, PG–3 Space Station CM (Boeing Huntsville)

d. Manager, Technical Compliance and Baseline Management Team (NASA and Boeing)

e. Manager, Change Management Team (NASA and Boeing)

f. Manager, Software Configuration Management and Configuration Status Accounting Team (NASA and Boeing)

g. Manager, Data Management Team (NASA and Boeing)

The following are ex–officio members:

a. ISSA Program

b. Space Shuttle Program Office

c. Mission Operations

d. Kennedy Space Center (KSC)

e. International Partners/Participants

f. Ad Hoc members as directed by the CMAIT Leaders.

A current listing of the CMAIT membership, their facility location, telephone numbers, fax numbers, and mailing addresses can be accessed via the CM Bulletin Board in Mosaic. Specific tasks of the CMAIT include the following:

a. Preparation and maintenance of the CMAIT Team Execution Plan

b. Configuration identification to identify all Program baseline documentation and to evaluate and maintain compliance with the intent of ISSA contracts, Memorandums of Agreement (MOAs), baseline documents, and specifications

c. Configuration control to provide an integrated process for change initiation, processing, and approval

d. Configuration status accounting to provide tracking and reporting of change processing and implementation status

e. Configuration verification to support design reviews and provide oversight authority for configuration audits (FCAs/PCAs), including readiness reviews and CM requirements compliance audits

f. Overall Program Data Management (PDM) including initial identification, analysis, and maintenance of all contract data requirements; assessment and control of "Proprietary" and

"Limited Rights" data; and all program data storage and retrieval, as well as, establishment and operation of the Program (NASA/Prime) data release system.

g. Overall management including resolution of CM issues related to policies and requirements, definition of CM requirements and tools for the Program, and monitoring of CM process implementation at the Prime and PG levels

The CMAIT reports to the System Analysis and Integration Team (SAIT). Figure 4–1 is representative of the AIT/IPT structure as specified in D684–10044–1, Program Execution Plan.

The CMAIT utilizes four subteams as follows:

a. Baseline Management and Technical Compliance Team

b. Change Management Team

c. Configuration Status Accounting and Software CM Team

d. Data Management Team

 The responsibilities of these subteams are summarized in the following paragraphs:

4.1 TECHNICAL COMPLIANCE AND BASELINE MANAGEMENT TEAM RESPONSIBILITIES

The Technical Compliance Team (TCT) is responsible for supporting the CMAIT in the preparation and maintenance of SSP 41170, Configuration Management Requirements, Data Requirements (DRs), (SDRs), and the CM Handbook for implementation on the ISSA Program and for monitoring the technical compliance with these documents.

Specific TCT tasks include the following:

a. Develop and maintain SSP 41170, Configuration Management Requirements document

b. Prepare, review, and approve applicable CM DRs and SDRs

c. Prepare and maintain the CM Handbook

d. Assure that all Statement of Work (SOW) CM sections are correct and compatible

e. Review and approval of PG CM plans

f. Prepare and maintain the Baseline Activity Index

g. Monitor the CM implementation to assure contract technical compliance

h. Support design reviews, configuration audits, readiness reviews, and CM audits

i. Coordinate, prepare, and review Technical Evaluations for contractor proposals

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                    Space Shuttle  - - - - - -  NASA Program
                    Interface                     Manager
                                                    Deputy
                                 Prime Program
                                   Manager
                                    Deputy          Systems
                                                    Manager
                                                                   Space Station
                                                                   Analysis &
                                                                   Integration
                            Business                                   Team
                            Management
                               AIT                                  System          Program
                                                                     AIT          Integration

  Program      Program       Program      Information    Program    Integrated     System        Program       Configuration
  Definition & Contracts &   Control      Systems        Visibility & Test         Engineering & Integration & Risk  Management
  Doc AIT      Materiel AIT  AIT          AIT            Metrics AIT & Verification Analysis AIT  Management AIT AIT
                                                                     AIT

              Utilization    Operations   Safety &       Vehicle    Risk
                 IPT           IPT         Mission         IPT       Management
                                          Assurance IPT             IPT
```

A current IPT/AIT structure will be maintained in the
Program Execution Plan.

FIGURE 4–1 ISSA PRIMARY PRODUCT TEAM STRUCTURE

4.2 CHANGE MANAGEMENT TEAM RESPONSIBILITIES

The Change Management Team is responsible for the overall planning, implementation, and administration of the ISSA Program integrated change process, including the processing, statusing, transmitting, and receiving of all change and change related data between NASA, the Prime, PGs, International Partners, and Program Participants.

Specific Change Management Team tasks include the following:

Provide Change Integration to do the following:

a. Change coordination with the Program/Prime/PGs/IPT/AITs, International Partners, and NASA participants

b. Classification of changes

c. Evaluation of changes for completeness

d. Compilation and release of the PCM/Composite Change Memo (CCM)

e. Support identification of affected Program/Prime/PGs/IPT/AITs, International Partners, and NASA organizations

f. Support change presentation meetings

g. Assure that the CM master file contains all required data

h. Development of proposal schedules

i. Coordination, review, assessment, and consolidation of Program/Prime/PGs/IPT/AITs impacts (technical and cost), and International Partner/Participant, and NASA organization Change Evaluations

j. Support development of composite implementation schedules

k. Preparation of change directives

l. Development of the change package for disposition

m. Status accounting of change activity

n. Support pricing activities

o. Development of the technical change packages [Engineering Change Proposals (ECPs) and Team Change Proposals (TCPs)]

Develop and maintain a Change Management system to do the following:

a. Support the development, review, and maintenance of the following documentation for Change Management requirements:

    (1) Configuration Management Requirements Document

    (2) Program Execution Plan

    (3) CMAIT Team Execution Plan

    (4) Configuration Management Handbook

b. Coordinate Change Management issues/concerns with Prime, PGs, NASA, and International Partners

c. Provide Change Management training

d. Prepare and maintain Change Management metrics

e. Support Program Change Review

f. Support CMAIT meetings

g. Support Prime/NASA Interface Control Working Group (ICWG)

Provide support to the Vehicle/Operations/Utilization/Safety and Mission Assurance (S&MA) IPT/AIT Issue resolution process including: coordinating issue meeting agendas/presentations; supporting cross IPT issue coordination; tracking issues/actions to resolution; publishing minutes and dissemination decisions as required; and maintaining and providing team metrics.

4.3 CONFIGURATION STATUS ACCOUNTING (CSA) AND SOFTWARE CONFIGURATION MANAGEMENT (SCM) TEAM RESPONSIBILITIES

The CSA/SCM Team is responsible for planning, implementation, and supervision of personnel providing CSA and SCM support to Prime Contractor Core CM, NASA CM, International Partner CM, the Software Development Integration Laboratory (SDIL), the Mission Build Facility (MBF), and software development activity of the prime including the following:

a. Configuration and Change Status Accounting which includes the implementation and maintenance of a Configuration Status Accounting system

b. Software CM which includes configuration identification, change control, configuration status accounting, and software control

c. CM Automated Systems which includes the development of requirements for the implementation of software tools and applications including the following:

   (1) Develop/Implement electronic CM forms with transmission processes and procedures

   (2) Provide CM personnel with applications and equipment required to support requirements

   (3) Assist PG CM personnel in the use of Prime/NASA CM automated processes

   (4) Coordinate CM computing and software requirements and associated support services with Information System organizations

4.4 DATA MANAGEMENT TEAM RESPONSIBILITIES

The Data Management (DM) Team is responsible for implementation of the DM process as required to ensure compliance with Prime and PG DRs. This includes establishing and implementing process controls for generation and handling of the flow of NASA, International Partners, Prime, and PG data.

Specific DM Team tasks include the following:

a. Define, analyze, and maintain program contract DRs

b. Manage change control of DRs

c. Manage data controls and transmittals (see Figures 4–2 and 4–3)

d. Provide data schedules, reports, and evidence of compliance

e. Provide Proprietary/Limited Data Rights assessments and controls

f. Provide data storage and retrieval service
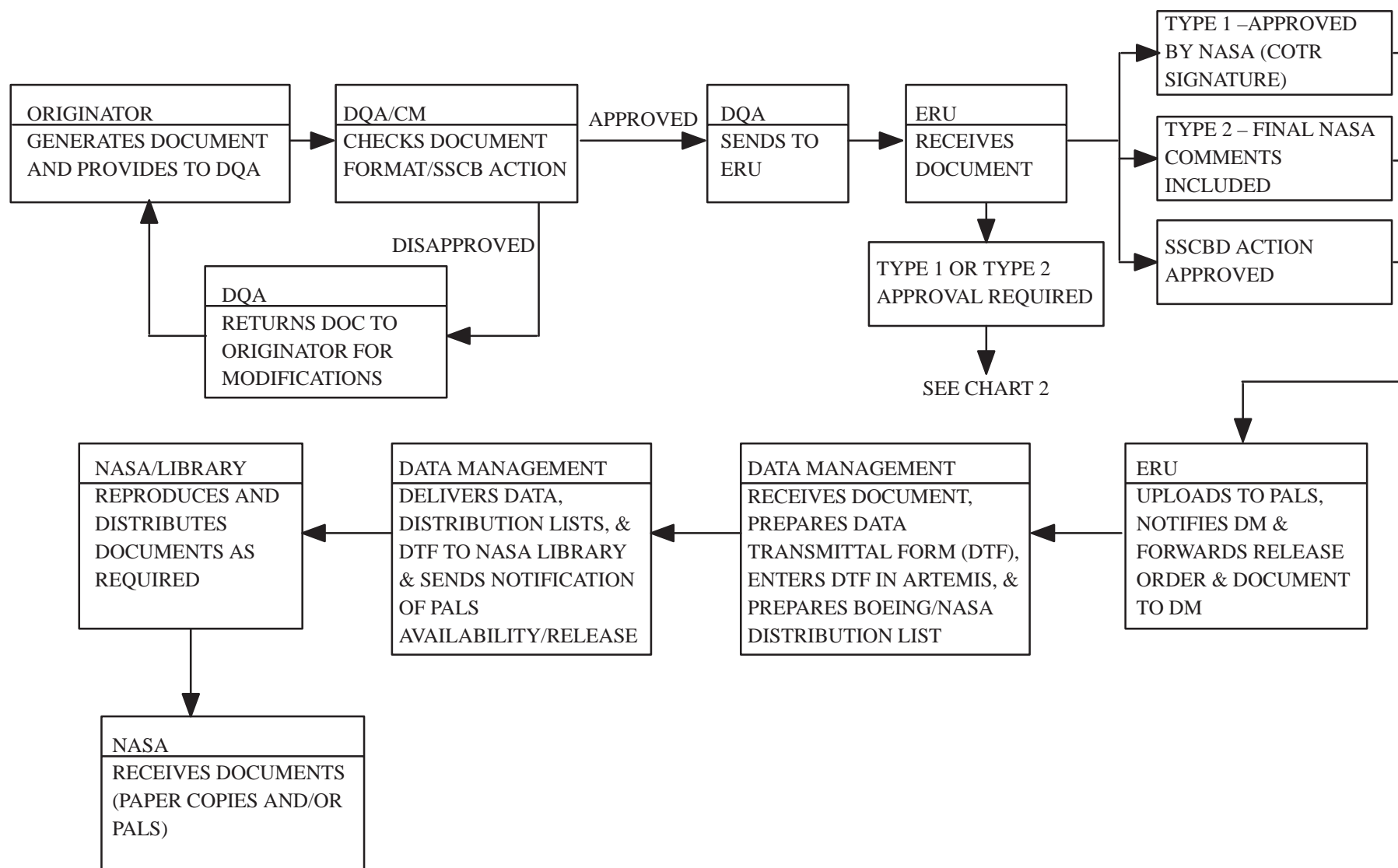
g. Develop D684–10002–1, Program Data Management Plan

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┌──────────────────┐     ┌──────────────────┐              ┌──────────────┐     ┌──────────────┐          ┌──────────────────────┐
│ ORIGINATOR       │     │ DQA/CM           │  APPROVED    │ DQA          │     │ ERU          │          │ TYPE 1 –APPROVED     │
│ GENERATES        │ ──► │ CHECKS DOCUMENT  │ ──────────►  │ SENDS TO     │ ──► │ RECEIVES     │ ──────►  │ BY NASA (COTR        │
│ DOCUMENT AND     │     │ FORMAT/SSCB      │              │ ERU          │     │ DOCUMENT     │          │ SIGNATURE)           │
│ PROVIDES TO DQA  │     │ ACTION           │              │              │     │              │          └──────────────────────┘
└──────────────────┘     └──────────────────┘              └──────────────┘     └──────────────┘
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APPROVED

DISAPPROVED

TYPE 2 – FINAL NASA COMMENTS INCLUDED

SSCBD ACTION APPROVED

DQA RETURNS DOC TO ORIGINATOR FOR MODIFICATIONS

TYPE 1 OR TYPE 2 APPROVAL REQUIRED

SEE CHART 2

NASA/LIBRARY REPRODUCES AND DISTRIBUTES DOCUMENTS AS REQUIRED

DATA MANAGEMENT DELIVERS DATA, DISTRIBUTION LISTS, & DTF TO NASA LIBRARY & SENDS NOTIFICATION OF PALS AVAILABILITY/RELEASE

DATA MANAGEMENT RECEIVES DOCUMENT, PREPARES DATA TRANSMITTAL FORM (DTF), ENTERS DTF IN ARTEMIS, & PREPARES BOEING/NASA DISTRIBUTION LIST

ERU UPLOADS TO PALS, NOTIFIES DM & FORWARDS RELEASE ORDER & DOCUMENT TO DM

NASA RECEIVES DOCUMENTS (PAPER COPIES AND/OR PALS)

FIGURE 4–2 PRIME DATA FLOW (CHART 1 OF 2)

TYPE 1 OR TYPE 2
APPROVAL REQUIRED

ERU
PLACES ELECTRONIC COPY IN HOLDING AREA; FORWARDS PAPER COPY TO DM

DATA MANAGEMENT
RECEIVES DOCUMENT, REVIEWS DATA TYPE; PREPARES DATA TRANSMITTAL FORM (DTF); & ENTERS DTF IN ARTEMIS

DATA MANAGEMENT
DELIVERS PRELIMINARY DATA AND DTF TO TECH LIBRARY

CONTRACTS
FORWARDS NASA DISTRIBUTION TO DATA MANAGEMENT

NASA
DISPOSITIONS AND SENDS CONTRACTUAL LETTER OR ISSUES SSCB DIRECTIVE

LIBRARY
DISTRIBUTES DOCUMENTS TO TPR FOR APPROVAL

DATA MANAGEMENT
ENTERS STATUS IN ARTEMIS

APPROVED

DATA MANAGEMENT
NOTIFIES ERU TO RELEASE DOC; SENDS DTF & DISTRIBUTION LIST TO LIBRARY WITH RELEASE REF.; & SENDS NOTIFICATION OF PALS AVAILABILITY/RELEASE

NASA LIBRARY
REPRODUCES AND DISTRIBUTES

DISAPPROVED

DATA MANAGEMENT
FORWARDS LETTER TO ORIGINATOR; SCHEDULES RESUBMITTAL

SEE CHART 1

FIGURE 4–2 PRIME DATA FLOW (CHART 2 OF 2)

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┌─────────────────────┐    ┌─────────────────────┐    ┌─────────────────────────┐    ┌─────────────────────┐
│ PRODUCT GROUPS      │    │ MATERIEL            │    │ DATA MANAGEMENT         │    │ AITs/IPTs           │
├─────────────────────┤    ├─────────────────────┤    ├─────────────────────────┤    ├─────────────────────┤
│ SEND DATA TO        │──▶ │ RECEIVES INCOMING   │──▶ │ RECEIVES DATA AND       │──▶ │ RECEIVES DATA;      │
│ MATERIEL            │    │ DATA AND PASSES TO  │    │ GENERATES A DATA        │    │ DISPOSITION DATA;   │
│                     │    │ DATA MANAGEMENT     │    │ TRANSMITTAL AND         │    │ RETURN SIGNED DT&I  │
│                     │    │                     │    │ INFORMATION (DT&I)      │    │ TO DM               │
│                     │    │                     │    │ FORM; GIVES COPY OF     │    │                     │
│                     │    │                     │    │ DATA TO APPROPRIATE     │    │                     │
│                     │    │                     │    │ AITs/IPTs THRU RESP.    │    │                     │
│                     │    │                     │    │ TECH MANAGER            │    │                     │
└─────────────────────┘    └─────────────────────┘    └─────────────────────────┘    └─────────────────────┘
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FIGURE 4–3 PRODUCT GROUP DATA FLOW

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APPENDICES: CONFIGURATION MANAGEMENT PROCESSES

The following appendices are not intended to define organizational structure but rather to identify ISSA CM processes and provide guidelines for use of the processes by ISSA elements as required by their specific participation and responsibilities within the program.

The CM processes are included in this Handbook as separate Appendices.

Appendix A	Abbreviations and Acronyms
Appendix B	Glossary
Appendix C	Integrated Change Processing
Appendix D	Documentation Management
Appendix E	Engineering Release
Appendix F	Deviations and Waivers
Appendix G	Configuration Status Accounting
Appendix H	Contract Engineering/Technical Compliance
Appendix I	Reviews and Audits
Appendix J	Configuration Management Analysis and Integration Team AIT/IPT Support
Appendix K	Action Item Process
Appendix L	Software Development, Production and Maintenance
Appendix M	Interface Working Group Support Plan
Appendix N	Canadian Space Agency Configuration Management Process/Interface
Appendix O	European Space Agency Configuration Management Process/Interface
Appendix P	National Space Development Agency of Japan Configuration Management Process/Interface
Appendix Q	Italian Space Agency Configuration Management Process/Interface
Appendix R	Russian Space Agency Configuration Management Process/Interface
Appendix S	ISSA Phase I of the RSA Contract, Configuration Management Process/Interface
Appendix T	Memorandum of Understanding between ISSA Program Configuration Management Office and the Space Shuttle Program Management Integration Office and the Space Shuttle Systems and Operations Integration Office

APPENDIX A ABBREVIATIONS AND ACRONYMS

ACO	Administration Contracting Officer
ADCN	Advance Drawing Change Notice
ADL	Applicable Document List
ADRN	Advance Document Revision Notice
AIT	Analysis and Integration Team
APM	Attached Payload Module
ASI	Italian Space Agency
ATS	Action Tracking System
BARS	Baseline Accounting and Reporting System
BD&SG	Boeing Defense and Space Group
BFD	Book–Form Drawing
BMAIT	Business Management AIT
BMO	Business Management Office
CACTIS	Change and Commitment Tracking Information System
CAD	Computer–Aided Design
CAGE	Commercial and Government Entity
CCM	Composite Change Memo
CCR	Change Commitment Record
CD	Change Directive
CDR	Critical Design Review
CE	Change Evaluation
CE	Change Engineer
CI	Configuration Item
CLIN	Contract Line Item Number
CM	Configuration Management
CMAIT	Configuration Management Analysis and Integration Team
CMO	Configuration Management Office
CO	Contracting Officer
COTR	Contracting Officer's Technical Representative
CPC	Computer Program Configuration

CPCI	Computer Program Configuration Item
CPL	Computer Program Library
CSA	Configuration Status Accounting
CSA	Canadian Space Agency
CSAR	Configuration Status Accounting Report
CSCI	Computer Software Configuration Item
DAR	Drawing Authentication Record
DCN	Document Change Notice
DDP	Design Decision Package
DDT&E	Design Development, Test and Evaluation
DIL	Deliverable Item List
DM	Data Management
DNMS	Data Number Management System
DOD	Department of Defense
DQA	Data Quality Assurance
DR	Data Requirement
DRD	Document Requirement Description
DRL	Data Requirements List
DSM	Drafting Standards Manual
DTF	Data Transmittal Form
DT&I	Data Transmittal and Instruction
DTN	Data Transmittal Notice
EB	Engineering Board
ECD	Estimated Completion Date
ECP	Engineering Change Proposal
EDL	Engineering Development Library
EDLS	Engineering Drawing Library System
EMS	Engineering Master Schedule
EOM	Engineering Operations Manual
ERCR	Engineering Release Completion Record
ERS	Engineering Release System
ERU	Engineering Release Unit

ESA	European Space Agency
EVA	Extravehicular Activity
FAI	First Article Inspection
FCA	Functional Configuration Audit
FEDP	Facility and Equipment Design Plan
FERD	Facility and Equipment Requirement Definition
FF	Fact Finding
GFE	Government–Furnished Equipment
GFP	Government–Furnished Property
GFY	Government Fiscal Year
HAS	Hardware Allocation Schedule
H/C	Hardcopy
H/W	Hardware
ICD	Interface Control Document
ICWG	Interface Control Working Group
ILS	Integrated Logistics Support
IP	International Partner
IPT	Integrated Product Team
IRN	Interface Revision Notice
IS	Information System
ISSA	International Space Station Alpha
IVA	Intravehicular Activity
JEM	Japanese Experiment Module
JMICB	Joint Mission Integration Control Board
JPRCB	Joint Program Requirements Control Board
JSC	Johnson Space Center
JTWG	Joint Technical Working Group
KSC	Kennedy Space Center
LP	Launch Package
MBF	Mission Build Facility
MDA	McDonnell Douglas Aerospace
MI	Modification Instruction

MOA	Memorandum of Agreement
MOD	Mission Operations Directorate
MOU	Memorandum of Understanding
MRB	Material Review Board
MSFC	Marshall Space Flight Center
MSS	Mobile Servicing System
NASA	National Aeronautics and Space Administration
NASDA	National Space Development Agency of Japan
N/P	Non Price
NTE	Not–To–Exceed
O&U	Operations and Utilization (MSFC)
OIPT	Operations Integrated Product Team
OPR	Office of Primary Responsibility
OSB	Outside the Board
PALS	Program Automated Library System
PC	Personal Computer
PCA	Physical Configuration Audit
PCDCN	Preliminary Contract Document Change Notice
PCI	Program Change Integration
PCIN	Program Change Identification Number
PCM	Preliminary Change Memo
PCN	Preliminary Change Notice
PCO	Procuring Contracting Officer
PCP	Program Change Proposal
PDM	Program Data Management
PDR	Preliminary Design Review
PE&I	Program Engineering and Integration
PEI	Program End Item
PG	Product Group
PG–1	McDonnell Douglas
PG–2	Rocketdyne
PG–3	Boeing Huntsville

PIA	Project Implementation Agreement
PIDS	Prime Item Development Specification
PIRN	Preliminary Interface Revision Notice
PMR	Program Management Review
POC	Point of Contact
POMG	Phase One Management Group
POPM	Phase One Program Manager
PP	Program Participant
PP&C	Program Planning and Control
PRB	Program Review Board
PRCB	Program Requirements Control Board
PSCN	Preliminary Specification Change Notice
PV	Photovolatic
QA	Quality Assurance
QAA	Quality Assurance Audit
QT	Qualification Testing
QTAI	Qualification Test Article Inspection
RDT	Requirements Development Team
RFD	Request for Deviation
RFP	Request For Proposal
RFR	Request For Recommitment
RFW	Request for Waiver
RKD	Rocketdyne
ROM	Rough Order of Magnitude
RSA	Russian Space Agency
RSC	Rocket and Space Corporation
RTM	Requirements Traceability Matrix
S&MA	Safety and Mission Assurance
SA	Supplemental Agreement
SAIT	System Analysis and Integration Team
SCM	Software Configuration Management
SCN	Specification Change Notice

SCR	Software Change Request
SDIL	Software Development Integration Laboratory
SDL	Software Development Library
SDR	System Design Review
SDRD	Specification Data Requirement Document
SFQR	Subcontractor Formal Qualification Review
SOW	Statement of Work
SPR	Software Problem Report
SRB	Software Review Board
SSAIT	Space Station Analysis and Integration Team
SSCB	Space Station Control Board
SSCD	Space Station Change Directive
SSCN	Space Station Control Number
SSF	Space Station Freedom
SSIS	Space Station Information System
SSP	Space Shuttle Program
SVF	Station Verification Facility
TBD	To Be Determined
TCP	Team Change Proposal
TCT	Technical Compliance Team
TD	Technical Direction
TE	Technical Evaluation
TEP	Team Execution Plan
TIA	Technical Implementation Agreement
TIM	Technical Interchange Meeting
TPR	Team of Primary Responsibility
TRR	Test Readiness Review
TTA	Technical Task Agreement
UIPT	Utilization Integrated Product Team
VAIT	Vehicle Analysis and Integration Team
VDI	Vehicle Design Integration
VE&T	Vehicle Effectiveness and Trades

VIPT	Vehicle Integration Product Team
VMDB	Vehicle Master Data Base
WA	Work Authorization
WBS	Work Breakdown Structure

APPENDIX B GLOSSARY

Change Commitment Record (CCR)
The CCR is the official prime IPT document reflecting the implementation plan developed by the IPT and agreed to by all affected PG IPT/AIT members. It documents the IPT/AIT implementation plan and schedule commitments needed to incorporate a specific change to the baseline as defined in the CCM. The CCR includes Program End Item (PEI), CI, and part number data to support program CM and product item delivery requirements.

Change Directive (CD)
The CD is the official NASA document used by the ISSA Program control boards, to disposition a change and is the sole authority for changing the Space Station configuration baselines. The CD may include instructions/actions for change implementation, funding requirements, schedule milestone requirements, Space Station resource allocation, and implementation effectivity.

Change Disposition Process
All proposed changes on the ISSA Program will be dispositioned at the lowest Program level IPT/AIT for which authority over all affected schedules, cost, and configuration–controlled items/documents resides. This function may be exercised via conducting a formal meeting or through an "Out of Board" review and sign–off process of a CD.

Change Engineer
The Change Engineer is the technical expert assigned by the IPT/AIT initiating the proposed change. The Change Engineer will originate the PCM and will be responsible for the technical coordination of a proposed change through the change process.

Change Evaluation
The Change Evaluation is the form used by the Program IPTs/AITs, NASA organizations and International Partners and Participants to document their assessments and impacts to proposed changes to the ISSA Program requirements baseline.

Change Integrator
The Change Integrator is the individual experienced with the change process assigned to support the Change Engineer in developing, submitting, and defining PCMs, CCMs, Engineering Change Proposals (ECPs), Program Change Proposals (PCPs), Team Change Proposals (TCPs), and internal changes.

Commitment
An event and its associated schedule, documented on the CCR, that supports a specific baseline or change activity and has signature approval by a IPT/AIT member that is responsible for the activity.

Composite Change Memo (CCM)
The CCM is the second phase of a Space Station change memo (originating from the PCM) used by the Prime/PG IPTs/AITs to further define the change description and impacts based on Prime/PG IPT/AIT inputs generated from the PCM. The CCM provides a complete description of a proposed change that the affected Prime/PGs IPTs/AITs will use to develop coordinated cost

estimates, schedule commitments, and changes, to configuration controlled items/documents. The CCM is the final change description for the Prime/PGs and is presented to the appropriate AIT for change disposition. The CCM forms the basis of the prime's ECP/PCP for submittal to NASA with the proposal cost package, or the TCP for Class II changes.

Configuration Item (CI)
An aggregation of deliverable hardware, firmware, software, or deliverable items, or any of its discrete portions which satisfies an end use function and is designated for CM and configuration control.

Event (CCR)
A discrete commitment by the Prime Contractor that identifies the specific work to be accomplished, who is responsible for the work, and when it will be accomplished. Each event must identify the Work Breakdown Structure (WBS), effectivity, IPT, responsible organization, type release, and the schedule dates.

Firm Cost Proposal
Firm estimates are prepared to definitize the price of a program or work package and are considered an obligation. Firm estimates are usually based on well–defined SOWs and plans and are in response to customer requests for a firm proposal. Firm estimates require submission of the greatest amount of cost detail and substantiating data.

First Tier Subcontract
First Tier subcontracts identify PG contract responsibilities within the prime contract. The first tier subcontracts are utilized as contracting instruments between Boeing Prime and the PGs.

Hardware Allocation Schedule (HAS)
The HAS is an online team hardware tracking database used by the Prime Contractor to schedule and allocate equipment and software between all ISSA team members.

International Partners
International Partners refers to the Partners of the ISSA Program [European Space Agency (ESA), National Space Development Agency of Japan (NASDA), Canadian Space Agency (CSA), and Russian Space Agency (RSA)].

International Program Participant
International Program Participant refers to the international organizations and their contractors, that participate in the ISSA Program, but are not full partners, such as the Agenia Spatiale Italiano (ASI).

Issue Definition Package
The package prepared for issues having cost, schedule or technical impacts to the existing contractual baseline and is presented to the appropriate Program AIT for technical approval and authorization to enter the formal change process.

Lead IPT
The Lead IPT is the Prime/PG IPT most affected by a proposed change, who has been assigned the responsibility as the Change Engineer. Typically, a proposed change will be initiated by the Lead IPT.

NASA Space Station Program Office
This refers to the NASA Space Station Program Office located at the Johnson Space Center (JSC) that manages the ISSA Program.

Not–To–Exceed (NTE) Estimate
A NTE estimate is a firm obligation to perform at a cost to the customer not greater than the NTE quotation, assuming no change in the contractual baseline since the NTE estimate. NTE estimates are generally quoted only when the SOW and the conditions are definitive enough to establish a firm basis for the estimate.

Partial Release
Before completing the entire CCR commitment process, the IPT may elect to release a portion of the CCR package. This "partial" release requires formal change control and the completed CCR will be released as a revision to depict the final commitments.

Preliminary Change Memo (PCM)
The PCM defines the proposed technical, design, and/or hardware changes of a change proposal. The PCM is distributed to all Prime/PG IPTs/AITs, International Partners, and NASA organizations for impact assessments which are collected and incorporated.

Prime Contract
The Prime Contract is the ISSA Program contract as contracted between NASA and Boeing as the Prime Contract Integrator responsible for the integration of the other PGs to deliver an integrated Space Station.

Prime Contractor
The Prime Contractor is Boeing Defense and Space Group, Missiles Space Division, Houston Texas. Responsibilities include integration of the ISSA PGs, as contracted by NASA, to deliver an integrated Space Station.

Product Groups (PGs)
The PGs are McDonnell Douglas (PG–1), Rocketdyne (PG–2), and Boeing Huntsville (PG–3).

Program End Item (PEI)
An identification number assigned to major deliverable items for cost collection and configuration control purposes.

Program Participants
Program participants refers to NASA organizations and their respective support contractors, other than the NASA ISSA Program Office, that have entered into a Memorandum of Understanding (MOU) agreement or inline Task Agreement with the ISSA Program. Examples of Program Participants are: KSC/Space Station Launch Site Support Office, JSC Mission Operations Directorate, JSC/Space and Life Sciences, JSC/Engineering Directorate, and Marshall Space Flight Center (MSFC)/Space Station Science and Utilization.

Rough Order of Magnitude (ROM) Estimate
ROM estimates are for analysis, preliminary program planning and scheduling purposes, and establishment of fund allocation. ROM estimates are usually prepared from minimal design and

work statement information. ROM estimates are not binding to perform a contract within a given price.

Work Breakdown Structure (WBS)
The WBS breaks the contractual work statement into logical packages. These packages are identified by a series of numbers and letters. The first four positions identify the WBS.

APPENDIX C ISSA INTEGRATED CHANGE PROCESS

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FIGURES

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C.1 PURPOSE

Appendix C defines and establishes an integrated change process that provides the means and authority to initiate, process, approve, and incorporate all changes on the ISS Program. Characteristics of this integrated change process include: using a common change form; implementing a common process to define and evaluate all technical, cost, and schedule impacts; interfacing with NASA for coordination of the International Partners and other NASA organizations; and placing emphasis on the IPT/AIT processing and disposition of changes at the lowest level possible. All ISSA IPTs/AITs and organizations will comply with the direction provided herein to support the change process. The implementation details for this procedure may vary within each ISSA IPT/AIT and organization, but must comply with the intent of this procedure.

C.2 OVERALL INTEGRATED CHANGE PROCESS FLOW

Figure C–1, ISSA Integrated Change Process Flow, Routine Implementation, Figure C–2, ISSA Integrated Change Process Flow, No Prime Impact, and the following subparagraphs identify the applicable process steps to be accomplished for routine changes. Figure C–1A, ISSA Integrated Change Process Flow, Urgent Implementation, identifies the process steps to be accomplished for urgent changes.

Program issues having cost, schedule and/or technical impacts to program baselines, are presented, (via an Issue Definition package), to the appropriate AIT for technical approval and authority to enter the formal change process. The PCM is prepared and distributed to the Program for impact assessment. Impact assessments are collected and incorporated into the CCM. A Technical Package is compiled and presented to the appropriate program level IPT/SSAIT/Board. If approved, a formal cost proposal will be authorized.

C.2.1 APPLICABILITY AND CHANGE CATEGORIES DEFINITION

NASA participants, International Partner, and Prime/PG changes will be documented on the Space Station Change Memo Form (See Attachment A), coordinated and provided to the appropriate level IPT/AIT for processing in accordance with the ISSA Integrated Change Process depicted in Figures C–1, CIA, and C–2. Changes initiated by NASA program participants that are under ISSA Technical Task Agreements (TTAs) or Project Implementation Agreements (PIAs) will process changes in accordance with CMAIT, Vehicle IPT (VIPT), Operations (OIPT), and Utilization IPT (UIPT) agreements shown in Appendix J, CMAIT AIT/IPT Support, Attachment A. Space Shuttle Program initiated changes will be submitted in accordance with Appendix T, Memorandum of Understanding between the ISSA Program Configuration Management Office, the Space Shuttle Program Management Integration Office and the Space Shuttle Systems and Operations Integration Office. Changes affecting only ISSA Phase 1 of the RSA Contract will be processed in accordance with Appendix S. Additional definition for changes initiated by International Partners is shown in the appropriate International Partner appendix. Change Memos will be developed and submitted in accordance with the following Change Categories.
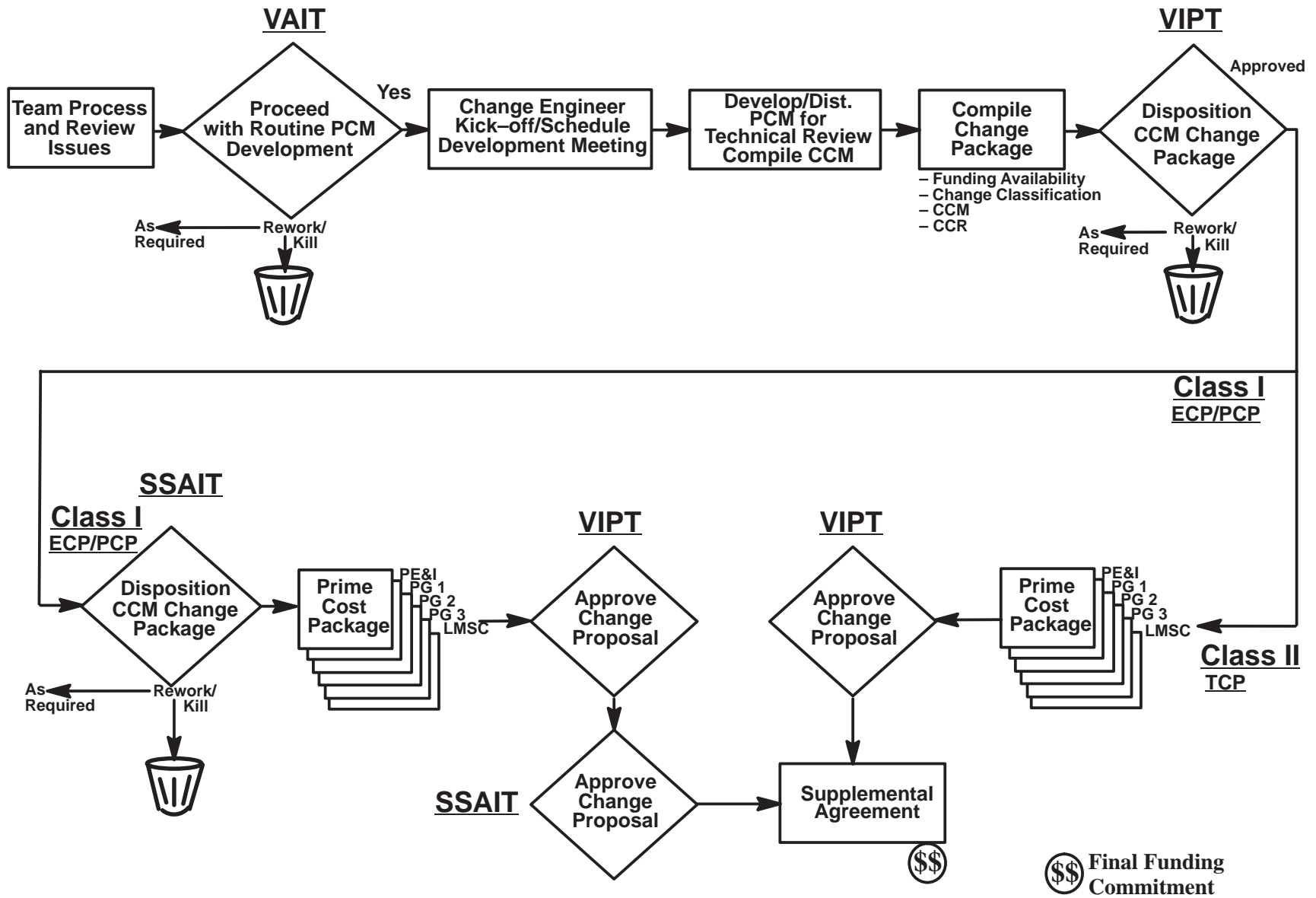
VAIT

Team Process and Review Issues

Proceed with Routine PCM Development

Yes

As Required ← Rework/ Kill

Change Engineer Kick–off/Schedule Development Meeting

Develop/Dist. PCM for Technical Review Compile CCM

Compile Change Package

– Funding Availability
– Change Classification
– CCM
– CCR

VIPT

Approved

Disposition CCM Change Package

As Required ← Rework/ Kill

Class I
ECP/PCP

SSAIT

Class I
ECP/PCP

Disposition CCM Change Package

As Required ← Rework/ Kill

Prime Cost Package

PE&I
PG 1
PG 2
PG 3
LMSC

VIPT

Approve Change Proposal

VIPT

Approve Change Proposal

Prime Cost Package

PE&I
PG 1
PG 2
PG 3
LMSC

Class II
TCP

SSAIT

Approve Change Proposal

Supplemental Agreement

$$

$$ **Final Funding Commitment**

FIGURE C–1 INTEGRATED CHANGE PROCESS FLOW, ROUTINE IMPLEMENTATION
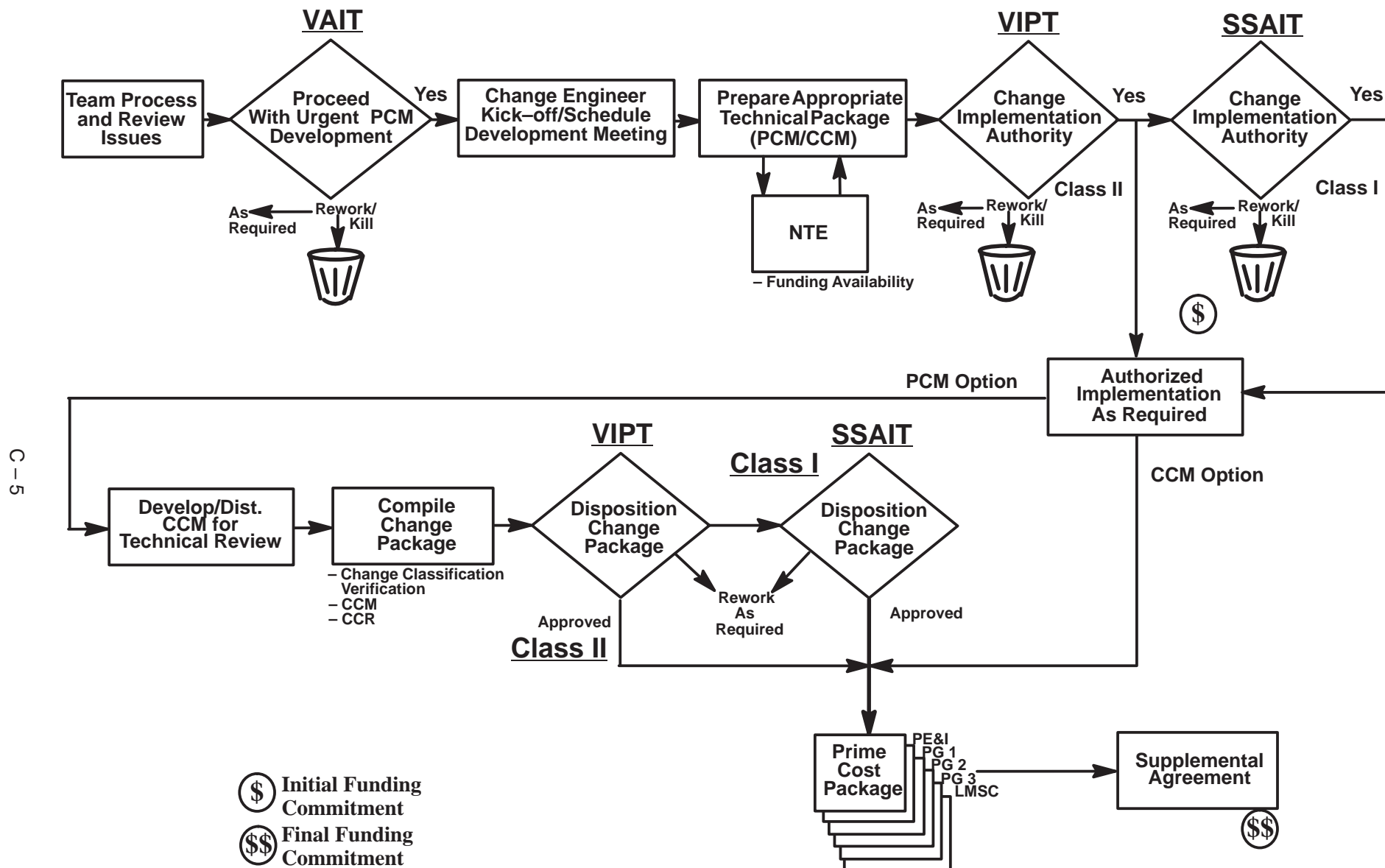
FIGURE C–1A INTEGRATED CHANGE PROCESS FLOW, URGENT IMPLEMENTATION

VAIT / OAIT / UAIT

Team Process and Review Issues

– Issue described
– Early ISSA team coordination
– Prime impact assessment

Proceed with PCM Development

Validate impacted teams at the AIT

Yes

Develop/Dist. PCM for Technical Review Compile CCM

Develop Cost Estimate (Includes Funding Profile)

Compile Change Package

– Funding Availability
– Change Classification
– CCM
– Schedule
– Cost Estimate

As Required ← Rework/Kill

VIPT / OIPT / UIPT

Disposition Change Package

Approved

As Required ← Rework/Kill

Within Team Delegated Cost, Schedule & Technical Authority

Yes

No

– Change Has International Partner Impacts

SSAIT

Disposition Change Package

Approved

As Required ← Rework/Kill

Implement Change In Accordance With CCM/Directive

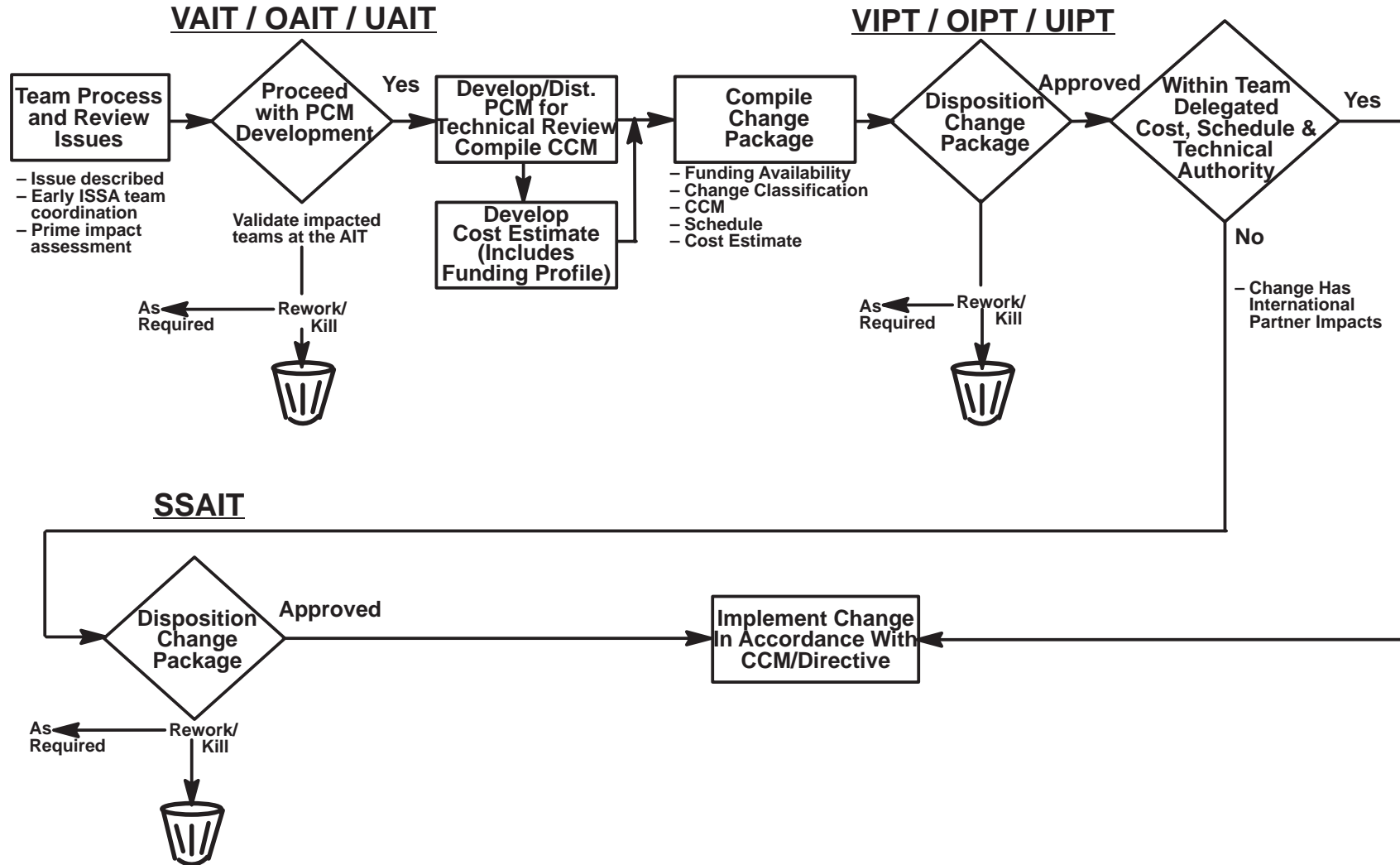**FIGURE C–2 INTEGRATED CHANGE PROCESS FLOW, NO PRIME IMPACT**

C.2.1.1 NASA BASELINE CHANGE (CLASS I) AFFECTING THE ISSA PRIME CONTRACTOR

ECPs and PCPs submitted by the Prime/PGs and NASA Change Directives will be processed to support implementation of a change to the Prime Contract or a NASA approved/controlled configuration baseline. These changes will be processed using each of the applicable steps depicted in Figure C–1.

C.2.1.2 NASA BASELINE CHANGE WITH NO–IMPACT/AFFECT TO THE ISSA PRIME CONTRACTOR

PCMs, CCMs and NASA Change Directives will be processed to support implementation of a change to a NASA approved/controlled configuration baseline that is not part of the ISSA Prime Contractor baseline. These changes will be processed using each of the applicable steps depicted in Figure C–2.

C.2.1.3 PRIME BASELINE CHANGE (CLASS II)

TCPs will be processed by the Prime/PGs to propose changes to the PG contract, or a change to prime–controlled baseline data. TCPs can be initiated by any PG, the Prime, or the Program level IPTs/AITs. TCPs require NASA concurrence but do not require NASA SSCB approval. Concurrence in classification of TCPs will be accomplished by the CMAIT. These changes will be processed using each of the applicable steps depicted in Figure C–1.

C.2.1.4 INTERNAL CHANGE

An internal change is a change to PG/NASA organization or International Partners controlled baseline data that is totally within the group's existing contract with no technical, cost, or schedule impact to another group's contract. Internal changes do not require prime AIT approval or concurrence for classification by any agency outside the originating organization. The NASA review for classification of internal changes is performed by the NASA member of the PG/NASA organization's IPT/AIT that dispositions the change. The Space Station change memo form or contractor/NASA or International Partners change form is acceptable.

C.2.2 ISSUE DEFINITION/PROGRAM AIT TECHNICAL APPROVAL

When program IPTs/AITs identify an issue having cost, schedule or technical impacts to the existing contractual baseline or other NASA configuration controlled baseline, an issue definition package is completed for presentation to the program AIT responsible for technical approval and authorization to enter the formal change process.

C.2.2.1 ISSUE DEFINITION

The Issue Definition presentation package to the program AIT will be prepared in accordance with Figure C–3. It will summarize the issue, reflect results from analysis and trade studies,
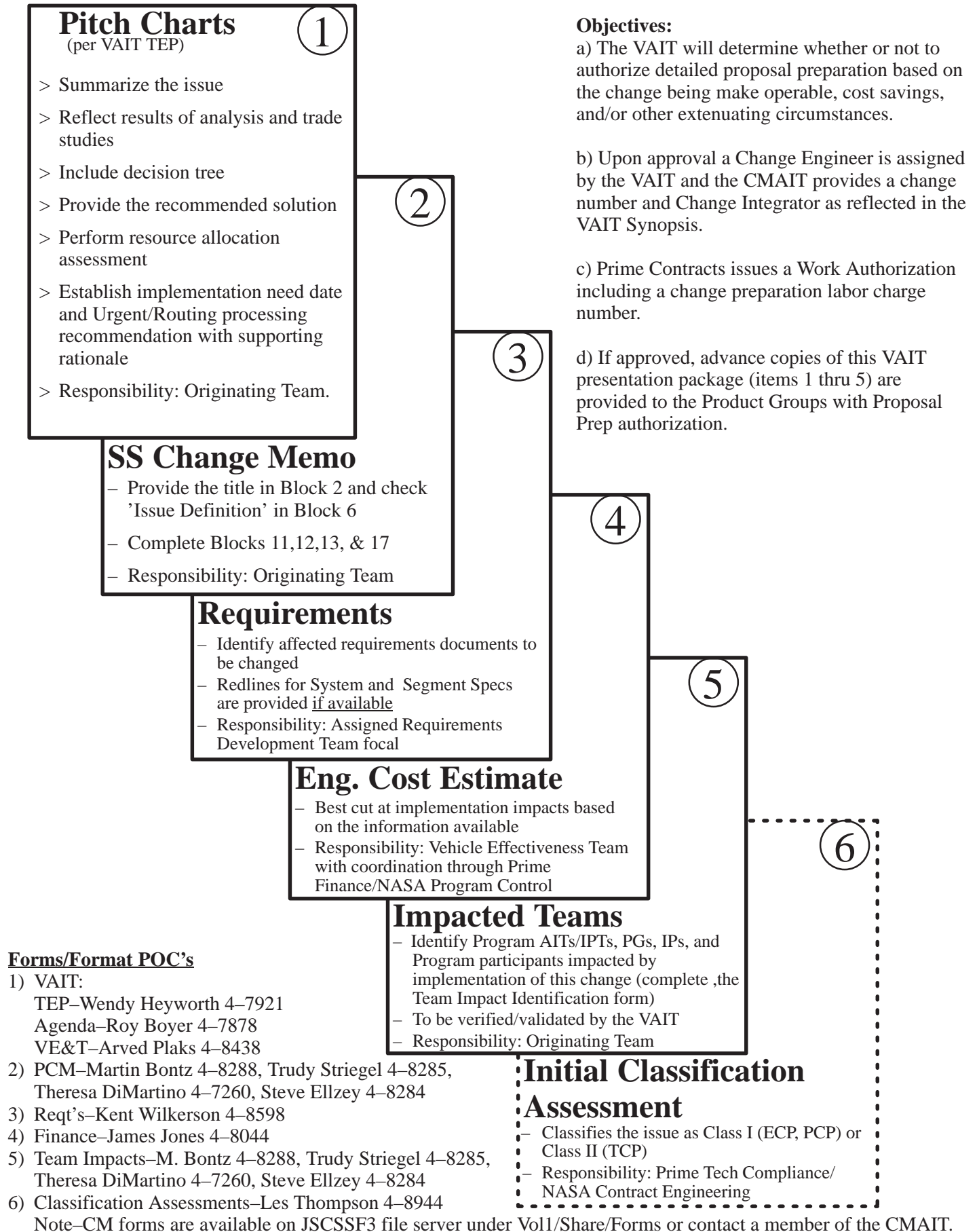
include decision trees and provide the recommended solution. An implementation need date will be established with supporting rationale. A resource allocation assessment will be provided and the originating IPT/AIT identified. In addition, blocks 11, 12, 13, and 17 of the Space Station Change Memo Form identified in Attachment A of this Appendix will be completed. The Requirements Development Team will provide a list of requirement documents impacted; a cost estimate will be developed by the Vehicle Effectiveness Team and Prime Finance/NASA Program Control; and impacted IPTs/AITs will be identified (completed Team Impact Identification Form, Attachment B). A Change Classification Assessment is completed by the CMAIT prior to the presentation. The CMAIT representative to the Program AIT will review the proposed Issue Definition package for completeness prior to presentation to the AIT. Product Group involvement during issue definition is minimal.

If an issue is generated by a PG, the initiating PG will coordinate the issue through a sponsoring Program IPT/AIT. The PG will provide the sponsoring Program IPT/AIT with the Space Station Change Memo Form with blocks 11, 12, and 13 completed, requirement issues identified, and a cost estimate for the initiating PG. Other impacted PGs and Program Engineering and Integration (PE&I) impacts will be estimated by the sponsoring Program IPT/AIT in coordination with the Vehicle Effectiveness Team and Prime Finance.

NASA Program Participants (PPs) and International Partners will initiate issues/proposed changes to their respective program level IPT/AIT for processing. The Operations, Utilization, and Safety & Mission Assurance IPTs/AITs will review issues/proposed changes to determine whether the Prime Contractor is impacted/affected by the change. If the Prime Contractor is impacted/affected, the issue/proposed change will be forwarded to the Vehicle AIT for processing in accordance with Figure C–1. International Partner change processing is further defined by the appropriate International Partner appendix of this handbook.

C.2.2.2 PROGRAM AIT APPROVAL

For issues affecting the Prime, the Vehicle AIT may technically approve Issue Definition packages for formal change processing and is empowered to authorize Prime contractor proposal preparation funding in accordance with Figure C–1. Acceptance to present to the VAIT must be approved by a recognized VAIT team member [reference VAIT Team Execution Plan (TEP)] and scheduled at the Wednesday business meeting. The Issue Definition package will be loaded onto the JSCSSF3 file server (or faxed to remote site VAIT participants) no less than 24 hours prior to VAIT presentation. The VAIT will determine the urgency of the change (based upon the rationale presented for implementation need date) and authorize initiation of proposal development. The Issue Definition package is presented to the program AIT for technical approval, validation of impacted IPTs/AITs and authorization to develop a PCM, CCM, ROM, NTE, Firm Proposal, and/or a NASA Cost Estimate for presentation to the IPT/SSAIT as appropriate. If disapproved, it will be so noted in the meeting minutes. If approved, by the IPT/AIT Co–Team Leaders, the CMAIT will assign a Space Station Change Number (SSCN) and Change Integrator. The SSCN, Change Integrator, Change Engineer, and PGs affected are

Pitch Charts
(per VAIT TEP)
(1)

> Summarize the issue

> Reflect results of analysis and trade studies

> Include decision tree

> Provide the recommended solution

> Perform resource allocation assessment

> Establish implementation need date and Urgent/Routing processing recommendation with supporting rationale

> Responsibility: Originating Team.

Objectives:

a) The VAIT will determine whether or not to authorize detailed proposal preparation based on the change being make operable, cost savings, and/or other extenuating circumstances.

b) Upon approval a Change Engineer is assigned by the VAIT and the CMAIT provides a change number and Change Integrator as reflected in the VAIT Synopsis.

c) Prime Contracts issues a Work Authorization including a change preparation labor charge number.

d) If approved, advance copies of this VAIT presentation package (items 1 thru 5) are provided to the Product Groups with Proposal Prep authorization.

SS Change Memo
(2)

– Provide the title in Block 2 and check 'Issue Definition' in Block 6

– Complete Blocks 11,12,13, & 17

– Responsibility: Originating Team

Requirements
(3)

– Identify affected requirements documents to be changed

– Redlines for System and Segment Specs are provided _if available_

– Responsibility: Assigned Requirements Development Team focal

Eng. Cost Estimate
(4)

– Best cut at implementation impacts based on the information available

– Responsibility: Vehicle Effectiveness Team with coordination through Prime Finance/NASA Program Control

Impacted Teams
(5)

– Identify Program AITs/IPTs, PGs, IPs, and Program participants impacted by implementation of this change (complete ,the Team Impact Identification form)

– To be verified/validated by the VAIT

– Responsibility: Originating Team

Initial Classification Assessment
(6)

– Classifies the issue as Class I (ECP, PCP) or Class II (TCP)

– Responsibility: Prime Tech Compliance/ NASA Contract Engineering

Forms/Format POC's

1) VAIT:
   TEP–Wendy Heyworth 4–7921
   Agenda–Roy Boyer 4–7878
   VE&T–Arved Plaks 4–8438
2) PCM–Martin Bontz 4–8288, Trudy Striegel 4–8285, Theresa DiMartino 4–7260, Steve Ellzey 4–8284
3) Reqt's–Kent Wilkerson 4–8598
4) Finance–James Jones 4–8044
5) Team Impacts–M. Bontz 4–8288, Trudy Striegel 4–8285, Theresa DiMartino 4–7260, Steve Ellzey 4–8284
6) Classification Assessments–Les Thompson 4–8944
   Note–CM forms are available on JSCSSF3 file server under Vol1/Share/Forms or contact a member of the CMAIT.

FIGURE C–3 ISSUE DEFINITION PRESENTATION PACKAGE TO THE PROGRAM AIT

reflected in the minutes. This information is red–lined on the Agenda, signed by the CMAIT representative, and forwarded to Prime Contracts. The CMAIT representative will also provide electronic notification to Prime Materiel. In the event that urgent implementation direction is required, the VAIT will authorize use of the urgent change process in accordance with Figure C–1A. The Operations, Utilization, Safety & Mission Assurance, and Vehicle AITs may technically approve Issue Definition PCMs for formal change processing for No–Prime impact changes which will be processed in accordance with Figure C–2.

C.2.2.2.1 PROGRAM LEVEL/PRIME/INTERNAL CHANGE NUMBERING

All program level changes initiated by the Prime, NASA, and the International Partners will be assigned an SSCN by the CMAIT Change Management Team. (PG/NASA/Program Participant organizations and International Partners internal changes will not require a SSCN.) These numbers will be assigned sequentially regardless of who initiates the change. A change log (identifying the change processing number, initiator, change title, Change Engineer, Change Integrator, and change disposition) will be maintained by the CMAIT Change Management Team.

Example: SSCN – SSCN 000001 through SSCN 999999

SSCNs will be assigned after IPT/AIT technical approval of the Issue Definition. The change record will be entered into CACTIS (as outlined in Appendix G, Configuration Accounting) at the time the SSCN is issued by the CMAIT.

Once initiated, SSCNs will be cancelled, suspended, or withdrawn through coordination of the SSCN Cancelled/Suspended/Withdrawn form, see Attachment C.

C.2.2.3 PROPOSAL PREPARATION WORK AUTHORIZATION

The Change Integrator will prepare an Issue Definition Transmittal form, see Attachment D, and attach it to the Issue Definition Package, to communicate the technical approval to the PGs via the CM Receipt Desk.

Prime Contracts, upon receipt of the IPT/AIT Agenda, will issue a proposal preparation work authorization. Prime Materiel, upon receipt of the work authorization will authorize the impacted PGs to support proposal preparation in accordance with the direction from the VAIT.

C.2.2.4 KICK–OFF/SCHEDULE DEVELOPMENT MEETING

The Program Definition & Change Integration AIT will conduct a scheduling meeting for all changes entering the formal change process. The meeting will establish the schedules for processing the change which will be entered into CACTIS. The necessity for a Technical Coordination meeting will be determined and scheduled, if required.

C.2.2.5 URGENT IMPLEMENTATION

Figure C–1A depicts the Integrated Change Process Flow to be used for changes requiring urgent implementation direction to avoid cost or schedule impacts. An NTE cost estimate is required prior to preparation of a firm proposal. Depending on the urgency of the change, the VAIT will authorize preparation of an NTE based on either the PCM or the CCM. In the event the NTE is prepared against the PCM, the IPT/SSAIT will authorize implementation of the change based on the PCM and NTE cost. The CCM is prepared in parallel. In the event the NTE is prepared against the CCM, the IPT/SSAIT will authorize implementation based on the NTE cost and the completed change package.

C.2.2.5.1 NOT–TO–EXCEED/NASA COST ESTIMATE

NTE cost estimates will be developed by the Prime Contractor and Product Groups based on SOWs and requirements definition (PCM, CCM) as directed by the VAIT. They will consist of contract language (Sections A–J), ground rules and assumptions, fiscal year spread including fee. Cost estimates will be prepared by all affected Program IPTs/AITs and NASA participants. Program IPTs/AITs will submit cost estimates to Prime Finance. NASA Program Control will obtain cost estimates from impacted Program Participants and consolidate with the Prime cost estimate using Attachment E, Integrated Cost Summary Form. Cost estimates will distinguish between Development Cost [activity that supports design, development/building and testing of hardware, software, facilities, systems, etc., (developing capability)] and Operational Cost (activity that supports operation and maintenance of hardware, software, facilities, systems, etc., after delivery and acceptance).

C.2.2.5.2 NTE MANAGEMENT REVIEWS/SUBMITTALS

A Management Review will be conducted prior to submittal of the Prime NTE to NASA. These reviews will be conducted utilizing the guidelines in Attachment F, Non–Prime and Prime Management Review Guidelines. Prime Contracts will submit the NTE prior to appropriate IPT/SSAIT disposition.

C.2.3 PCM/CCM/DEVELOPMENT AND DISTRIBUTION

The Change Engineer, with support from the Change Integrator, will coordinate development of the PCM. The PCM will be distributed to the Program and assessed for technical impacts. A response must be received from all mandatory evaluators prior to CCM development. The technical assessments will be compiled, as the complete technical scope of the change, to create the CCM. Prior to dispositioning of the change by the appropriate IPT/SSAIT, the draft CCM will be distributed.

C.2.3.1 PCM DEVELOPMENT

The PCM will be prepared in accordance with Attachment A of this Appendix. The PCM package is developed in accordance with Figure C–4. As the PCM is developed, many events

are performed in parallel; i.e., requirements traceability, and development of the FROM/TO language for specifications and other appropriate program documentation. This language is technically coordinated between the Prime and affected Program Participants/PGs. The Change Engineer will approve the completed PCM for distribution and identify the mandatory evaluators required to complete a Change Evaluation Impact Assessment Form.

During PCM development the Change Engineer is responsible for developing the change. The Change Engineer's Team consists, as a minimum, of the following:

a. Requirements Development Team Focal – Responsible for requirements and/or interface documentation input

b. CMAIT Change Integrator – Facilitator of change

c. CMAIT Technical Compliance – Change Classification Assessment

d. Change Definition & Integration AIT – CCR/Schedule input

e. Finance – Prime Cost input

f. Program Control – NASA Cost input

As the Team Leader for the change, the Change Engineer will facilitate the integration of the change and develop the summary and technical description of the change. The Change Engineer is also responsible for the overall accuracy, quality, and completeness of the change.

Following PCM release, revisions to the PCM may be released with the approval of the Change Engineer and the Change Integrator. PCM revisions will be identified in Block 6 of the Space Station Change Memo form. The first revision will be identified as Revision A with each subsequent revision assigned the next sequential alpha character. The revisions made to the PCC will be identified and an explanation for each revision will be provided in the body of the PCM. Revised PCMs will be released/distributed in the same manner as the original PCM.

C.2.3.2 CHANGE EVALUATION/IMPACT ASSESSMENT FORM AND INSTRUCTIONS

The Change Evaluation/Impact Assessment Form will be used to provide the evaluation/impact assessment of each PCM. The Form and Instructions as shown in Attachment G of this appendix will be included with the PCM package after the last page of the PCM. The Change Integrator will complete Blocks 1 and 4 of the Change Evaluation/Impact Assessment Form before PCM package distribution.

C.2.3.3 IDENTIFICATION OF VMDB IMPACTS

A VMDB Impact form, Attachment H, will be distributed with the PCM package to facilitate identification of impacts to the VMDB assuming implementation of the change. The Change Engineer/Change Integrator will be the focal for collecting the impact forms and forwarding to the Vehicle Integration Team. The Vehicle Integration Team is responsible for incorporation of VMDB impacts into their Change Evaluation/Impact Assessment.

Objectives:
a) The PCM is released for distribution once the CE and CI have agreed that the change has been fully developed with all available information (completion of items 1 & 1a). Mandatory evaluators will be notated on the distribution list, however assessments/evaluations will be accepted from any program participant.

b) Submitted assessments/evaluations will be incorporated into the CCM and redistributed to program participants with identified impacts to the PCM (VMDB impacts are provided to the Vehicle Integration Team and not incorporated).

c) Formal From/To's (PSCNs, PIRNs) are developed in parallel to the evaluation cycle and incorporated into the CCM prior to release.

① SS Change Memo (PCM)
> All appropriate blocks are completed (ref. CM Handbook–SSP 50123) and PCM Release is checked in Block 6. Blocks 8, 9 and 10 are N/A at this time.

> The Change Engineer and Change Integrator are ultimately responsible for completion of all tasks relative to developing the change and assuring sufficient coordination between all affected parties.

> Responsibility: CE/CI

①a Rqt's From/To's
– Integrated into the PCM form
– Generate System & Segment Spec language
– Add all known changes to Prime/PG Contracts & attachments, PIDS, ICDs, ADLs, DIL, GFP, etc.
– Responsibility: Requirements Development Team focal and coordinated with Vehicle Integration Team and Product Groups

② Distribution List
– Identifies mandatory evaluators consistent with the Team Impact Identification form
– Provides the approved labor charge #
– Provides evaluation due date (per Item #4)
– Distributed to all Program Teams, IPs, and Participants
– Responsibility: CE/CI

③ Chg. Assessment Form
– Vehicle for the program to assess the PCM for completeness and provide comments/impacts as required
– Evaluations/Assessments shall be signed by the NASA and Prime co–leads
– Inputs will be incorporated into the Consolidated Change Memo (CCM)
– Responsibility: Evaluators

④ VMDB Impacts Form
– Distributed with the PCM to facilitate identification of VMDB impacts assuming implementation of the change.

⑤ Committed Chg. Sched.
– Prior to completion and distribution of the PCM the proposal development/submittal schedule is committed and included with the PCM distribution
– Adherence to this schedule is tracked via CACTIS and briefed to the program each week at change review
– Responsibility: Prime PP&C

Forms/Format POC's
1) Change Memo (PCM):
 Reqt's Analysis–Req't Owner
 VMDB–Rex Shoreman 4–7434
 Reqt's Traceability–Amos Adams 4–8562
 Form & Dist.–Change Integrator as assigned.
1a)Reqt's–Kent Wilkerson 4–8598
 PG SOWs–Chris Reinhart 4–8575
 Interfaces–Jim McCormick 4–7880
2) Distribution List–Steve Ellzey 4–8284
3) Change Evaluation/Impact Assessment–Chg. Integ.
4) Change Schedules–Mike Zachau 4–8149
 CACTIS–Judy Johnson 4–8593

Note–CM forms are available on JSCSSF3 file server under Vol1/Share/Forms or contact a member of the CMAIT.

FIGURE C–4 PRELIMINARY CHANGE MEMO PACKAGE DEVELOPMENT AND DISTRIBUTION

C.2.3.4 PRELIMINARY CHANGE MEMO PACKAGE DISTRIBUTION

The PCM distribution list will be prepared and maintained by the CMAIT. The distribution list contains the Program IPTs/AITs, International Partners, other NASA organizations as required, and the Prime PGs. The Change Engineer and the Change Integrator will also identify the mandatory evaluators who are required to submit a Change Evaluation/Impact Assessment Form on the distribution list and include evaluation due dates. Program IPTs/AITs responsible for TTAs will distribute the change to the affected program participants for evaluation/assessment.

PCM Packages will be electronically distributed via E–Mail to the Program IPTs/AITs, International Partners, other NASA organizations, and the Prime PGs as identified on the PCM distribution list. This distribution will be accomplished through the CM Receipt Desk ISSA to other CM Receipt Desks (which include International Partners, other NASA organizations, and the Prime PGs), and by the Change Management Team to the Program IPT/AIT and organizations. No Materiel/Contracts direction is required. Hardcopy distribution will be made by the Change Integrator as required. The PCM Package will be electronically stored in PALS. The CM Receipt Desk ISSA will forward PALS notification to all other CM Receipt Desks.

The Change Integrator will:

a. Ensure the PCM Package is complete and contains all required data, in accordance with the PCM Checklist and Assembly Guide, Figure C–5

b. Obtain necessary signatures

c. Electronically distribute completed package with electronic signature to the CM Receipt Desk ISSA and Program IPT/AIT/organizations Co–Team Leaders as identified on the distribution list

d. Perform hardcopy distribution as necessary

e. Submit original hardcopy of the PCM Package to the CM Receipt Desk ISSA

The CM Receipt Desk ISSA will:

a. Verify the PCM Package has electronic signatures

b. Distribute the electronic PCM Package to the CM Receipt Desks of the International Partners, other NASA participants, and the Prime PGs

c. Upload the PCM into PALs and electronically distribute the PALS notification of the PCM Package to the CM Receipt Desks and program IPTs/AITs

d. File original hardcopy in the CM Master Change File

PCM CHECKLIST AND ASSEMBLY GUIDE

- **Distribution List**

  — Most current version used (from the SSF3/Vol1/Share Server)

  — Change number and title are correct

  — Change Integrator/Engineer/RDT Focal are included on Delta Distribution

  — Mandatory evaluators identified on the List or are included on Delta distribution

  — Correct SALCO No. identified

  — Correct Distribution Date identified

  — Correct Evaluation Due Date identified

- **PCM**

  — Most current version used (from the SSF3/Vol1/Share Server/Directory)

  — Prime/Non–Prime Change Engineers and RDT Focal identified w/Respective Organizations and Phone Nos.

  — Change Integrator identified w/Phone No.

  — Attachment(s) (e.g., Specification/ICD updates, graphics, etc.) identified in PCM [if applicable]

  — Applicable Attachment(s) are attached to PCM and are properly identified (e.g., "Attachment," "Attachment 1," etc.) and properly page–numbered

  — Lead/Change Management Team Leader initialed prior to PCM approval signature

  — Change Engineer signed and dated

- **Space Station Change Evaluation/Impact Assessment Form and Instructions**

  — Most current version used (from the SSF3/Vol1/Share Server/Directory)

  — Correct SSCN and Title are included

- **Classification Assessment**

  — Include in folder for information only

  — Reference Data (e.g., Letters, Presentations, Correspondence, etc.)

FIGURE C–5 PCM CHECKLIST AND ASSEMBLY GUIDE

C.2.4 MANDATORY EVALUATIONS

Following receipt of the PCM, each mandatory and affected Program IPT/AIT, International Partner, NASA participant, and Prime PG is responsible for expeditiously reviewing, assessing impacts, and providing a change evaluation/impact assessment to the Change Engineer/Change Integrator. Program IPTs/AITs responsible for TTAs will provide any program participants impacts as a part of their evaluation/assessment. The NASA participants and Program IPTs/AITs responsible for TTAs and PIAs will include any cost and schedule impacts with the Change Evaluation/Impact Assessment Form. The cost package is developed in accordance with Attachment E, and as described in paragraph C.2.2.5.1. This will be accomplished using the Change Evaluation/Impact Assessment Form and Instructions provided with the PCM Package. (Prime PGs will submit the evaluation/impact assessment as agreed to with the CMAIT and the Prime's Contract and Materiel Representatives).

Upon completion of the Change Evaluation/Impact Assessment Form, Program IPTs/AITs, Product Groups, International Partners and NASA participants (i.e., Shuttle, etc.) will ensure that the evaluation/impact assessment is signed by the appropriate Manager or Program Team Co–Leads and electronically transmitted via E–Mail, or notification provided of the PALS location, to the CM Receipt Desk ISSA. One reproducible hardcopy will also be forwarded to the CM Receipt Desk ISSA. The CM Receipt Desk ISSA will forward the evaluation/impact assessment to the Change Engineer/Change Integrator.

C.2.5 CCM DEVELOPMENT/DISTRIBUTION

The Change Engineer/Change Integrator will compile the change evaluation/impact assessments and update the PCM to build the CCM. All From/To language updates resulting from the evaluation/impact assessment of the PCM will be coordinated with the Requirements Development Team (RDT) Focal. The Change Engineer will facilitate this coordination and the "agreed To" language will be submitted in the Requirements Development Team's or the document owner team's evaluation/impact assessment of the PCM. The Change Engineer and/or Change Integrator will ensure the following:

a. All mandatory evaluators have submitted a Change Evaluation/Impact Assessment Form with the appropriate signatures

b. All "From/To" language updates have been coordinated with the RDT focal and are reflected in the Requirements Development Team's or document owner's change evaluation/impact assessment. The Preliminary Specification Change Notices (PSCNs) and signed Preliminary Interface Revision Notices (PIRNs) will be included in the CCM

c. Implementation tasks, Program milestone and schedules identified have been coordinated

d. Appropriate signatures have been obtained for the CCM (including VAIT team lead approval)

A draft CCM (signed only by the Change Engineer) will be distributed to all Mandatory Evaluators and impacted Teams prior to IPT/SSAIT disposition so that NTEs and/or NASA Cost

Estimates and program schedules can be validated. Following formal CCM release, revisions to the CCM may be released with the approval of the Change Engineer and the Change Integrator. CCM revisions will be identified in Block 6 of the Space Station Change Memo form. The first revision will be identified as Revision A with each subsequent revision assigned the next sequential alpha character. The revisions made to the CCM will be identified and an explanation for each revision will be provided in the body of the CCM. Revised CCMs will be released/distributed in the same manner as the original CCM.

C.2.5.1 FIRM/NASA COST ESTIMATE

Cost estimates will be prepared by all affected Program IPTs/AITs and NASA participants. Program IPTs/AITs will submit cost estimates to Prime Finance. NASA Program Control will obtain cost estimates from impacted Program Participants and consolidate with the Prime cost estimate using Attachment E. Cost estimates will distinguish between Development Cost [activity that supports design, development/building and testing of hardware, software, facilities, systems, etc., (developing capability)] and Operational Cost (activity that supports operation and maintenance of hardware, software, facilities, systems, etc., after delivery and acceptance).

C.2.5.2 ROM/FIRM/NTE MANAGEMENT REVIEWS/SUBMITTALS

A Management Review will be conducted prior to submittal of the Prime firm proposal to NASA. These reviews will be conducted utilizing the guidelines in Attachment F. Prime Contracts will submit the firm proposal subsequent to appropriate IPT/SSAIT disposition.

C.2.5.3 NASA CHANGE PROPOSAL COST VOLUME PREPARATION

The NASA members of the IPTs/AITs and participants will prepare and submit cost estimates to NASA Program Control. Program Control will consolidate cost estimates to support the NASA management review.

C.2.6 CCR DEVELOPMENT

The Program Definition & Change Integration AIT, with support from the Change Engineer/Change Integrator, will compile the task and schedule data from the change evaluation/impact assessments to build the Change Commitment Record in accordance with Attachment I. The CCR will be used to document the commitments to support the design, analysis and development, test, and delivery of all program products and associated documentation. The CCR will also be used to document changes, develop the most expedient, cost effective incorporation plan and to commit Program members to this specific plan. A preliminary CCR will be made available at the time of draft CCM distribution. The final CCR will be validated against the distributed CCM prior to inclusion in the change package.

C.2.7 CHANGE PACKAGE

The Change Package will be prepared in accordance with Figure C–6. The change package will consist of the following:

a. Draft Composite Change Memo/Preliminary Change Memo, if appropriate

b. Final CCR (unavailable if for urgent PCM process)

c. Non–Prime Schedule Inputs

d. Presentation for IPT/AIT/Board dispositioning the change

e. Change Directive Prepared and ready to sign

f. Final Change Classification form (unavailable if for urgent PCM process)

g. Not–To–Exceed cost, if appropriate

h. ROM cost, if appropriate

C.2.7.1 CHANGE PACKAGE PRESENTATION

 The change package presentation will address the following as appropriate:

a. Agenda

b. Background summary of change

c. Proposal ground rules

d. Description of change including impacts to all Program IPTs/AITs and organizations, NASA organizations, International Partners, and PGs

e. Impacts to baseline specifications and ICDs

f. Impacts to Flight and Ground Operations

g. Implementation schedules and impacts to ISSA Program Milestones

h. Disconnects between PGs/Prime, Program IPTs/AITs and organizations, Prime/NASA organizations, and International Partners that cannot be resolved by the Change Engineer/Change Integrator

i. Make/buy decisions

j. Any unique support organization or facility requirements

k. New capital assets/existing resources

l. Additional staffing requirements

m. Cost data – The presentation of the cost data should include identification of cost drivers, and cost and price summaries

n. Risk Assessment

o. Contractual considerations, which may include new or revised contract terms and conditions [to include Contract Line Item Numbers (CLINs) and articles, or special provisions), unique delivery requirements, and contractual documents affected

Pitch Charts ①

> Summarize the issue

> Reflect results of analysis and trade studies

> Include decision tree

> Provide a cost/sched/tech impacts for the recommended solution

> Provide the implementation need date

> Responsibility: CE/CI

Objectives:

a) The three major pieces of the change package brought forward for disposition are; the CCM (technical impacts), Cost estimate (cost impacts), and the CCR (schedule impacts). Together these pieces form the basis for a management implementation decision.

b) For Class II changes, VIPT approval provides sufficient authority for the Prime to authorize implementation. Class I changes will go to the SSAIT for final disposition.

c) For urgent processing the technical package eill be accompanied by NTE costs while routine changes will have no additional cost package other than the cost estimate supplied to the VAIT.

② SS Change Memo (CCM)

– All Blocks are complete with the exception of Blocks 9 & 10. Block 9 will be completed by the VIPT and Block 10 by the SSAIT if required
– Block 6 should have CCM Release marked and signed by the CE
– Responsibility: CE/CI

②a Rqt's From/To's

– All appropriate PSCNs/PIRNs, etc. are attached for incorporation upon approval of the change
– Responsibility: Requirements Development Team focal and coordinated with Vehicle Integration Team and Product Groups

③ Change Commitment Record (CCR)

– All releases and implementation milestones are committed and tracked upon implemenation direction via program schedules
– Responsibility: Prime PP&C

④ Not–To–Exceed
(Applicable only to Urgent processing)

– PG NTEs along with Prime costs are consolidated into a Prime NTE. Non–Prime costs are included as applicable
– Responsibility: Prime Finance/NASA Program control

⑤ Final Classification Assessment

– Classifies the issue as Class I (ECP, PCP) or Class II (TCP)
– Responsibility: Prime Contract Compliance/ NASA Contract Engineering

Forms/Format POC's
1) VIPT Agenda–Lisa Koteras 4–8024
2) CCM–Change Engineer/Change Integrator as assigned.
2a) Reqt's–Kent Wilkerson 4–8598 Interfaces– Jim McCormick 4–7880
3) Change Commitment Record (CCR)– Mike Zachau 4–8149
4) Finance–James Jones 4–8044
5) Classification Assessments–Les Thompson 4–8944
Note–CM forms are available on JSCSSF3 file server under Vol1/Share/Forms or contact a member of the CMAIT.

FIGURE C–6 CHANGE PACKAGE TO THE IPT

The Change Engineer, as supported by the Change Integrator, will present the change package to the appropriate program level IPT/AIT/Board for review and disposition.

C.2.8 CHANGE DIRECTIVE DEVELOPMENT

The ISSA Program/Prime Change Directive will be prepared by the Change Integrator and the Change Engineer. The CD will be prepared using the forms and preparation instructions included in Attachment J (Class II Changes) or K (Class I Changes) of this appendix. The CD may include instructions/actions for change implementation, funding requirements, schedule milestone requirements, Space Station resource allocation, and implementation effectivity. The CD will reflect the disposition of the change as it is to be presented; will have attachments which reflect the exact change wording/data; or will cite the documents which describe the change; and will be ready for signature upon disposition. For Class I changes, the draft directive will be distributed for coordination to all affected International Partners and NASA participants prior to the meeting at which it will be dispositioned and approved by the NASA Program Manager. The proposed distribution list will be coordinated during this period. A copy of the draft directive will also be provided to the Prime and NASA Contracts organizations to facilitate predisposition preparation of any contract related letters of direction. For Class II changes, the directive will be approved by the Prime Vehicle Manager.

Directives will be revised in accordance with the instructions provided in Attachments J and K, using the forms included in the attachments.

C.2.9 CHANGE APPROVAL AND IMPLEMENTATION

The Change Approval and Implementation consists of disposition of the change package by the appropriate Program–level IPT/AIT/Board, Prime Contractor or other NASA ISSA Program Contract fact finding, negotiations, contract authorization and contract definitization, Close–out of Change Directive Action Items and completion/closeout of CCM implementation tasks.

C.2.10 CHANGE PACKAGE DISPOSITION

Each change package will be dispositioned by the appropriate program level IPT/AIT/Board. The Change Engineer/Change Integrator are responsible for presenting the change package for disposition. Each proposed change will be reviewed and dispositioned by the appropriate Program–level IPT/AIT/Board before implementation. Change Packages will be distributed to appropriate IPT/Board members at least two days prior to the meeting to facilitate review and disposition in a timely manner.

Each proposed change will be dispositioned at the lowest Program–level IPT/AIT/Board for which authority over all activity, schedules, cost, and configuration controlled items/documents resides.

The Program–level IPT/AIT/Board is responsible for reviewing and evaluating all activities and impacts associated with the implementation of the proposed change and dispositioning the change (i.e., approved for implementation, disapproved, deferred to a higher Program–level IPT/AIT/Board or for review at a later date).

The Program–level IPT/AIT/Board Leader or his delegate will disposition the change(s). The Change Engineer and Change Integrator will be represented at change disposition meetings to facilitate decision making.

For changes that impact the Prime Contractor and are processed in accordance with Figure C–1, the Vehicle IPT (VIPT) has been authorized to approve Class II (TCP) changes and direct Prime Contractor implementation. The Prime Team Co–Leader of the Vehicle IPT is empowered to approve the change with the NASA Team Co–Leader's concurrence. (Note: NASA is to concur technically on the change.) Prior to VIPT presentation and review distribution of the CCM, concurrence signatures are obtained out–of–board from the VAIT Co–chairmen. The CCM will be signed by the impacted program level IPTs, International Partners, as required, and the VIPT Team Co–Leaders at the VIPT. For Class I (ECP/PCP) changes, the SSAIT is authorized to disposition the change. The NASA SSAIT Team Co–Leaders will sign the CCM and the NASA Space Station Program Manager (or his delegated representative) and the affected International Partners will sign the Change Directive to disposition the Change Package (Approve or Disapprove) for Class I changes.

For changes that have no Prime Contractor impact and are processed in accordance with Figure C–2, the empowered program level IPT/AIT/Board will disposition the change. The CCM will be signed by the impacted program level NASA IPT Team Co–Leaders and International Partners, as required. Those changes that do not affect/impact International Partners may be approved and a Change Directive signed by the Program IPT NASA Lead. The NASA Space Station Program Manager (or his delegated representative) and the affected International Partners will sign the Change Directive to disposition the Change Package when International Partners are impacted (Approve or Disapprove).

Upon disposition of the change(s), the Change Integrator will release the CCM and complete the CD, modifying it to reflect board decisions. He/she will obtain the necessary signatures at the board.

Dispositioning of the change package will occur at formal IPT/AIT/Boards or may be processed as an Outside the Board (OSB) change.

CDs may be processed OSB if the proposed change does not impact Program cost, schedule, resource allocation, system performance, operations, maintenance, or utilization; and/or is agreed to by all International Partners, IPTs/AITs, PGs and NASA participants potentially affected by the change.

For Class I (ECP/PCP) changes approved for urgent implementation as depicted in Figure C–1A, the SSAIT/SSCB may direct the release and Prime Contractor implementation of the final CCM, and approved Program Level Baseline documentation changes (i.e., SCNs, IRNs, DCNs, etc.).

C.2.11 DISTRIBUTION OF CCM/CHANGE DIRECTIVE

The CM Receipt Desk ISSA will upload the CCM/CD into PALS; will send notification to the Program IPTs/AITs and all other CM Receipt Desks; and will file the original CCM/CD in the CM Master Change File. The Change Integrator will facilitate hardcopy distribution as required. For CCM distribution to the PGs, no Contracts/Materiel direction is required.

C.2.12 PRIME CHANGE PROPOSAL COST VOLUME PREPARATION

The Prime IPTs/AITs will prepare and submit task sheets to the Business Management AIT (BMAIT) Finance in accordance with the Finance Estimating Policy (to be provided). PG–1 and PG–2 will formally submit their cost estimates to the Prime Material organization via their respective contracts organizations. PG–3 will submit its cost estimates to the Prime Contracts organization via their contracts organization. The Prime Contracts and Materiel representative of the PGs will forward a copy of the cost estimates to BMAIT Finance and the Change Engineer who will complete his/her technical review. BMAIT Finance will collect the Prime IPT/AIT and PG estimates, and review them with the Change Engineer. The Program Financial Management AIT will ensure compliance with applicable management pricing policy, Government regulations and laws, quality and integrity guidelines, and will consolidate the package to support the Prime management review of the cost volume.

C.2.13 SUBMIT PRIME ENGINEERING CHANGE PROPOSAL/PROGRAM CHANGE PROPOSAL TO NASA

The Prime ECP/PCP will consist of a technical package prepared in accordance with Attachment L, Technical Package Preparation Instructions for the Firm Proposal and a cost package, as required. This proposal will be submitted to NASA Procurement via the Prime Contracts organization for review, fact–finding, negotiations, and authorization for implementation.

C.2.14 FACT FINDING AND NEGOTIATIONS

Fact finding/negotiations will be chaired by NASA Procurement and Prime Contracts and will precede contract authorization/definitization for changes not requiring immediate implementation. In the event that immediate implementation is required, fact finding/negotiation activity will follow.

C.2.15 CONTRACT AUTHORIZATION AND CONTRACT DEFINITIZATION

Contract Authorization and Contract Definitization can occur separately (for those changes requiring immediate implementation) but follow the same sequence of events: For changes to a NASA controlled baseline, direction is issued to the Prime via NASA Contracting Officer

authorization document. Upon its receipt, Prime contracts will release a work authorization enabling the Prime to proceed with the change as approved/negotiated. Subcontractors will then receive authorization to proceed through the proper Prime Contract/Materiel channels. The affected Product Groups will subsequently flow direction to Tier II subcontractors.

For changes to Prime controlled baselines (Class II), the above is applicable with the exception that no direction is required from the NASA Contracting Officer.

C.2.16 CHANGE DIRECTIVE ACTION ITEMS

The Program Definition and Change Integration AIT documents, tracks and coordinates closure of Change Directive action items.

C.3 RESPONSIBILITIES

Each of the following teams/organizations are responsible for performing the actions identified:

C.3.1 NASA PROCUREMENT

The Program Contracting Officer (PCO) will

a. Provide change direction/authority via PCO letter and/or contract modification
b. Establish Fact–finding requirements and schedule
c. Conduct negotiations

C.3.2 PRIME CONTRACTS

Prime Contracts will:

a. Issue proposal preparation authorization for Prime and PG–3
b. Schedule internal management reviews as applicable
c. Submit proposals and cost estimates to NASA via contracts letter
d. Conduct fact–finding, negotiations, and contract modification
e. Submit proposal updates as required
f. Provide timely liaison, coordination, and correspondence with PG–3
g. Provide timely change implementation authorization to PG–3 contracts.
h. Provide PG–3 proposals to Prime Finance (Cost) and the Change Engineer (Technical)
i. Provide direction for Prime contract change activity via Work Authorization (WA) updates

C.3.3 PRIME MATERIEL ORGANIZATION

The Prime Materiel organization will do the following:

a. Issue proposal preparation authorization for PG–1 and PG–2

b. Provide timely liaison, coordination, and correspondence with PG–1 and PG–2 Contracts organizations

c. Provide timely change implementation authorization to PG–1 and PG–2 contracts organization.

d. Receive, evaluate, negotiate, and definitize subcontract change

e. Provide PG–1 and PG–2 proposals to Prime Finance (Cost) and the Change Engineer (Technical)

f. Provide supplier interface with IPTs/AITs, team management, and Prime point of contact to ensure proper technical, cost, and schedule coordination

g. Request cost estimates from the PGs, as required

C.3.4 CHANGE ENGINEER

The Change Engineer is empowered with the overall responsibility (development, submittal, and definitization) for the change proposal and will function as the technical expert. This requires coordination with Prime/PG Program IPTs/AITs and organizations, functional organizations, International Partners, and NASA organizations. The Change Engineer's tasks include, but are not limited to:

a. Preparation of Issue Definition package to appropriate AIT (in most cases)

b. Identification of impacts to configuration–controlled documents/items with RDT focal

c. Development of proposal schedules

d. Drafting of the PCM and coordination of FROM/TO language with PGs and RDT focal

e. Identification of affected IPTs/AITs/International Partners/NASA organizations/PGs

f. Review and approval of the CCM

g. Review and approval of the CCR

h. Development and approval of Prime task sheets

i. Review and approval of PG technical proposals

j. Development of Change Package

k. Management Review support

l. IPT/AIT/Board dispositioning change support

m. Fact–finding support

n. Proposal update support

o. Negotiations support

p. Overseeing the transfer of technology

q. Review, assessment, and consolidation of international participant and NASA organization involvement in the change process

r. Development and presentation of the change package to the AIT for change disposition

C.3.5 CHANGE INTEGRATOR

The Change Integrator will be responsible for supporting the Change Engineer in the development, submittal, and definitization of the change proposal. This support includes coordination with Prime/PG IPTs/AITs, functional organizations, International Partners and NASA organizations. The Change Integrator's tasks include, but are not limited to the following:

a. Facilitator of PG/Change Engineer coordination with Prime Contracts/Materiel

b. Compile the PCM/CCM

c. Identify affected IPTs/AITs/International Partners/NASA organizations

d. Support change presentation meetings

e. Facilitate maintenance of change files

f. Develop proposal submittal schedules as described in the CACTIS Users Guide

g. Coordinate, review, assess, and consolidate Prime/PG IPT/AIT, International Partners and participant, and NASA organization impacts (technical and cost)

h. Support development of CCR

i. Prepare Change Directives

j. Develop the change package for change disposition

k. Perform status accounting of change activity

l. Support pricing activities

m. Support development of cost estimates

n. Compile technical change package

o. Support fact–finding activities as required

p. Support proposal updates as required

q. Support price negotiations as required

C.3.6 AFFECTED PRIME/PRODUCT GROUP IPT/AIT

Affected Prime/Product Group IPTs/AITs will do the following:

a. Coordinate with all functional disciplines that support the IPT (i.e., materiel, manufacturing, scheduling, quality assurance, finance estimating, etc.)

b. Ensure that all cost estimates' substantiation is commensurate with change classification and Finance organization's direction

c. Ensure all schedule commitment activity is coordinated with scheduling organization

d. Prepare/provide CCM inputs to the Change Integrator

e. Product Groups ensure timely flowdown of requirements changes to Tier II subcontractors.

C.3.7 AFFECTED NASA PROGRAM IPT/AIT

Affected NASA Program IPTs/AITs will do the following:

a. Coordinate with all functional disciplines that support the IPT, with the NASA PPs, affected International Partners TTAs/PIAs, and Shuttle Program interfaces that are managed by the IPT

b. Determine if Shuttle Program/NASA PPs are affected by the proposed change (PCM Issue Definition through CCM stage); authorize NASA PPs to evaluate changes; integrate the PPs evaluations (including cost and schedule impacts) into the IPT/AIT's change evaluation; and direct NASA PPs implementation and close–out of approved changes

c. Receive NASA PPs and Shuttle Program issues/proposed changes and sponsor these issues/proposed changes for processing through the ISSA Integrated Change Process

d. Prepare/provide CCM inputs to the Change Integrator

C.3.8 AFFECTED INTERNATIONAL PARTNERS

The affected International Partners will do the following:

a. Maintain cognizance of issues/changes brought to the VAIT

b. Participate in the VAIT to determine potential impacts upon the International Partner caused by changes under consideration before entering the formal change system

c. Provide timely evaluation of PCMs/CCMs affecting the International Partner or negotiate a mutually acceptable schedule with the Change Integrator

d. Formally notify the CMAIT of an intention to exercise International Partner appeal rights to the SSCB regarding disposition of a change

e. Participate in the disposition of changes that affect the International Partner by attending the SSAIT/SSCB as appropriate, and by signing approved bilateral directives

f. Implementation within the International Partner IPT approved bilateral directives

C.3.9 PRIME PP&C

The Program Definition & Change Integration AIT will do the following:

a. Support change presentation meetings

b. Coordinate, review, assess, and develop composite implementation schedules for Prime, PGs, Program IPT/AIT/organizations, International Partners, and NASA organization change impacts

c. Schedule SSCB/Prime team change disposition meetings

d. Publish SSCB/Prime change disposition meeting minutes

e. Report change processing status as defined in CACTIS Users Guide

f. Support IPT/AIT pricing activities

g. Support development of cost estimates

h. Support fact–finding activities as required

i. Support proposal updates as required

j. Support price negotiations as required

k. Status, tracking, and support close–out of SSCB and Change Directive Actions

C.3.10 CHANGE MANAGEMENT TEAM

The Change Management Team will do the following:

a. Assist the IPTs/AITs in the assignment of Change Engineers

b. Provide Change Integrators and SSCNs

c. Be responsible to oversee and administer the overall processing of changes

d. Be responsible for the status, maintaining, transmitting, and receiving of all changes and change–related data between NASA, the Prime, PGs, International Partners, and NASA organizations

e. Provide meeting support to program IPTs/AITs (Agendas, Minutes, CM Focals)

f. Provide program issue tracking

C.3.11 PRIME TECHNICAL COMPLIANCE/NASA CONTRACT ENGINEERING

Technical compliance in coordination with Contract Engineering will:

a. Provide Initial and Final Change Classification Assessments (Class I vs. Class II)

b. Provide technical/contractual guidance as focal support to the various program IPTs/AITs as required

C.3.12 PRIME FINANCE ESTIMATING

The Prime Finance estimating group will do the following:

a. Provide guidance for all price development and substantiation activity

b. Commit to availability of price estimates

c. Provide liaison/coordination with NASA regarding change price activity and risk items, as applicable

d. Coordinate pricing groundrules with Contracts, Materiel, and Finance organizations

C.3.13 PROGRAM CONTROL ESTIMATING

The NASA Program Control members support to the VIPT, OIPT, UIPT, S&MA IPT and SSAIT will do the following:

a. Support the NASA IPTs/AITs in development of cost estimates for the Issue Definition and Final CCM Phase

b. Integrate the Prime NTE and NASA cost Estimate for each change package for presentation to the approving IPT/AIT/Board

c. Determine funding availability for each change

d. Evaluate CCMs for overall ISSA schedule milestone impacts

C.3.14 CONFIGURATION MANAGEMENT RECEIPT DESK/ENGINEERING RELEASE UNIT

The CM Receipt Desk will do the following:

a. Send electronic mail notification of PALS upload and electronic distribution of all changes and change–related data to NASA Program Office/Prime and PGs and affected International Partners.

b. Serve as the receipt point for all official change–related submissions from the PGs, NASA participants, and International Partners, and provide to the appropriate Change Integrator.

c. Maintain Master Change Files and released documentation.

ATTACHMENT A TO APPENDIX C
SPACE STATION CHANGE MEMO FORMS AND PREPARATION INSTRUCTIONS

This attachment provides instructions for preparing the Space Station Change Memo.

These instructions define the content requirements for each data element of the PCM/CCM Form. The item numbers below correspond to the block numbers on the referenced form. The change originator is responsible for addressing each block of the change memo as best as available information allows prior to VAIT presentation. All IPT/AIT/ORGs that review the PCM are responsible for providing inputs to the Change Engineer/Change Integrator for any/all blocks that require additional description to fully define the IPT/AIT/ORG's impact. The Change Engineer/Change Integrator is responsible for incorporating all CCM inputs in development of the CCM, as well as CCM revisions following the original release.

Use the following instructions to complete each block on the form:

1.   SSCN – Enter the SSCN number assigned by the CM AIT Change Management Team after the VAIT has approved the PCM for formal change processing. The pages should be numbered sequentially and include a total of all pages.

2.   Title – The Change Originator will enter a concise, definitive title, starting with an action verb, including abbreviations or acronyms only if necessary. The CCM will use the same title as the PCM.

3.   Change Engineer (P)/Change Engineer (NP) – Enter the name of the Change Engineer(s); his/her phone number; his/her IPT/AIT, organization or PG, the Requirements Development Team Focal and his/her phone number, his/her IPT/AIT, and the Change Integrator name and phone number.

4.   Change Classification – Enter the Prime change classification by checking the appropriate block. ECP, PCP for Class I changes and TCP for Class II changes. If the change does not affect the ISSA Prime Contractor check the Non–Prime block.

5.   Priority – The Change Originator will enter the change priority using one of the following:

       1) Routine – A routine priority will be assigned only when emergency or urgent is not applicable.

       2) Urgent – An urgent priority will be assigned for any of the following reasons:

       — To effect a change in operational characteristics which, if not accomplished expeditiously, may seriously compromise the mission effectiveness of deployed equipment.

       — To correct a potentially hazardous condition, the uncorrected existence of which could result in injury to personnel or damage to equipment. A potentially hazardous condition compromises safety and embodies risk, but within reasonable limits, permitting continued use of the affected equipment provided the operator has been informed of the hazard and appropriate precautions have been defined and distributed to the user.

— To meet significant contractual requirements (e.g., when lead time will necessitate slipping approved production, activation, or construction schedules if the change were not incorporated).

— To effect an interface change which, if delayed, would cause a schedule slippage or increased cost.

3) Emergency – An emergency priority will be assigned for either of the following reasons:

— To effect a change in operational characteristics which, if not accomplished without delay, may seriously compromise the integrity of the ISSA.

— To correct a hazardous condition which may result in fatal or serious injury to personnel or extensive damage or destruction of equipment. A hazardous condition usually will require withdrawing the item from service temporarily, or suspension of the item operation, or discontinuance of further testing or development pending resolution of the condition.

Code – The Change Originator will identify the justification code in accordance with MIL–STD–480B and enter here on the form:

— Code A – Record Only

— Code B – Interface

— Code C – Compatibility

— Code D – Correction of Deficiency

— Code O – Operations or Logistics Support

— Code P – Production Stoppage

— Code R – Cost Reduction

— Code S – Safety

— Code V – Value Engineering

Authorization Need Date – Indicate the required date for implementation of the proposed change and provide supporting rationale in Block 13.

The change should be identified as follows:

— Make Operable

— Cost Savings

— Enhancement (Justification shall be provided when this block is checked)

6. Enter the appropriate status of the change:
   — Issue Definition: Indicates approval by the VAIT for PCM/CCM proposal development.
   — PCM Release: Indicates approval by the Change Engineer for PCM release and distribution. Prime/PGs/NASA participants and

International Partners shall develop change evaluations/impact assessments.

— CCM Release: Indicates approval by the Change Engineer for CCM release and distribution.

— Revision: Indicates approval by the Change Engineer of revision to the PCM/CCM released above.

The Change Integrator will enter issue dates for the PCM, CCM, and revisions. They will reflect the dates that each issue is approved for release. Subsequent PCM/CCM revisions will be sequentially assigned and entered showing the current revision letter and the issue date.

7.   Team Impact – The Change Initiator will enter the team impact as identified during the issue definition phase. The Change Engineer will update the team impact, as required, before releasing the CCM. This update will be based on the responses received from the IPT/AIT/ORG's review of the PCM.

Note: PGs will enter their change internal number to the right if their block is checked.

8.   VAIT Approval – Indicates VAIT approval to proceed to VIPT (may be obtained outside of the meeting).

9.   VIPT Disposition:

9(A). CCM Concurrence: Indicates concurrence from program IPTs/AITs and International Partners that the CCM contains a satisfactory description of program impacts and that the CCM is ready for disposition.

9(B). CCM Disposition:
    Indicates disposition of the change by the VIPT
    — Class I – Approve for SSAIT presentation – Self explanatory.
    — Class II – Approve – Provides NASA concurrence with the Change Classification.
    — Non–Prime – Approve for SSAIT presentation if required.
    — Disapprove – Self explanatory.

10.   SSAIT Disposition – Self explanatory.

11.   Description of Change – The Change Initiator will enter a descriptive summary of the proposed change and identify all known NASA/Prime baselined documents affected with appropriate "From/To" language. In addition, all known groundrules or assumptions (i.e., technical, schedule, pricing, required change authorization date, etc.) for the change processing and change implementation will be included. This block is supplemented in the CCM. Add applicable correspondence relative to the change (letter number and date).

12.   Reason for Change/Background Summary – The Change Initiator will enter a description of the events that led to the identification of the problem(s) that this change proposes to

correct, and will enter a brief definition of the problem(s). In addition, the Change Initiator will include any trade studies, reports/problem reports applicable to the change, alternatives considered, analysis and comparison of alternatives showing detailed calculations as necessary including boundary conditions, inputs (including test data), ground rules and assumptions, and analytical tools (models, equations, algorithms).

13. Consequences if not Implemented – The Change Initiator will document adverse conditions or impacts due to nonincorporation of the proposed change.

14. Items Affected – The Change Initiator will check the various elements that may be affected by the change. The Change Engineer/Change Integrator and all IPT/AIT/ORGs that review the PCM will address these elements to confirm that all impacts of the change are defined. (ALL items must be checked yes or no.)

Note: The Product Groups are to identify major Tier II subcontractors affected by implementation of the proposed change via line 40.

15. How Affected – Identify by its number each item marked yes in Block 14, provide a definitive description of any affected item, and define exactly how it is affected. If established NASA formal or Prime/PG internal baseline documentation is affected, identify document number, title, revision level, and date.

16. Configuration Items Affected – Complete with available information by the Change Engineer/Change Initiator on the PCM and supplemented, as required, by CCM inputs from the Prime/PGs IPTs/AIT/ORGs.

End Item No.:	Identifies affected CIs, CSCIs, or nondeliverable end items impacted by the change.
Nomenclature:	Identifies the name or type designation of the affected item.
Effectivity:	Identify end item serial number and quantity.

Notes:
Enter Documentation or Schedule Change Only if there is no impact to CIs, CSCIs, or nondeliverable end items.
Common Items affected will be identified by CI Number, Nomenclature, Provider, Users, Quantity, and Serial Numbers

17. Action Coordinated With – List of all teams/organizations (include individual names) coordinated with and an indication of those who did and did not concur with the recommendations.

18. Description of Implementation Tasks – The Change Initiator/Change Engineer will identify the Program Level IPTs/AIT/ORGs that are impacted by the proposed change, as best known on the Team Impact Form prior to PCM release and formal change processing. Reference of tasks to WBS are to be provided as available.

This block will be supplemented, as required, by CCM inputs from the Prime/PG IPTs/AITs, before releasing the CCM.

19. Continuation Block/Continuation Page – Provided for continuation of data from previous pages. The block being continued must contain a reference to the continuation page as well as a reference to the block continued from at the start of the continuation.

1. SSCN	Space Station Change Memo	Page 1 of

2. Title:

3. Prime Change Engineer   Team   Phone #
    Non–Prime Change Engineer   Team   Phone #
    R D T Focal   Team   Phone #
    Change Integrator   Phone #

4. Change Classification:

  Class I   Class II   [ ]Non–Prime

[ ] ECP   [ ]PCP   [ ] TCP

5. Priority: **Code:**   **Auth. Need Date:**

  [ ] Make Operable   [ ] Cost Savings   _____

    [ ] Enhancement (Justify)

6.[ ] Issue Definition – VAIT Acceptance: Date:
   [ ] PCM Release   – CE Signature: Date:
   [ ] CCM Release: – CE Signature: Date:
   [ ] Revision: – CE Signature: Date:

7. Team Impact: **International:**   [ ] Prime   Internal Change No.
   [ ] NASA   [ ] PG1 (MDA)   _____
   [ ] ISSA Phase 1   [ ] ESA   [ ] CSA   [ ] PG2 (RKD)   _____
   [ ] Shuttle: Chg No._____   [ ] NASDA   [ ] RSA   [ ] PG3 (BHSV)   _____
   [ ] Other (Specify)   [ ] ASI   [ ] LMSC (FGB)   _____

8. VAIT Approval to Proceed to the VIPT:
   NASA: Prime:

9. (A) VIPT CCM Concurrence:

Business Management AIT:

   NASA: Prime:

Operations IPT:

   NASA: Prime:

Utilization IPT:

   NASA: Prime:

Safety & Mission Assurance IPT

   NASA: Prime:

International Partners (as required):   ESA:

    CSA: NASDA:

    RSA: ASI:

9. (B) VIPT CCM Disposition:
[ ]Class I–Technical Approval for SSAIT Presentation   [ ]Class II–Auth. to Implement   [ ]Non–Prime Tech. Approval   [ ] Disapprove
Remarks:

NASA: Date: Prime: Date:

10. SSAIT Disposition:
     [ ] Approve   [ ] Disapprove   Remarks:

   NASA: Date: Prime: Date:

1. SSCN	Space Station Change Memo	Page 2 of

11. Description of Change:

12. Reason for Change/Background Summary:

13. Consequences if Not Implemented:

1. SSCN	Space Station Change Memo	Page 3 of

14. Items Affected

Yes/No

1. [ ] [ ] Specifications
2. [ ] [ ] ICDs/IRDs
3. [ ] [ ] Document/Specification Tree
4. [ ] [ ] Part Number/Serialization
5. [ ] [ ] Performance
6. [ ] [ ] Resources
7. [ ] [ ] Safety
8. [ ] [ ] Survivability
9. [ ] [ ] Reliability
10. [ ] [ ] Maintainability
11. [ ] [ ] Service Life
12. [ ] [ ] Environments
13. [ ] [ ] Parts, Materials,& Processes
14. [ ] [ ] Critical Single Point Failure Items
15. [ ] [ ] Commonality
16. [ ] [ ] Verification Plans
17. [ ] [ ] Software Development and Integration
          Laboratory (SVF, MBF)
18. [ ] [ ] ILS Plans
19. [ ] [ ] Logistics Support Analysis
20. [ ] [ ] Maintenance Plans/Procedures
21. [ ] [ ] Spares and Repair Parts
22. [ ] [ ] Operational and Maintenance
          Manuals
23. [ ] [ ] Facilities
24. [ ] [ ] Support Equipment
25. [ ] [ ] Training/Training Equipment
26. [ ] [ ] Packaging/Handling/Storage/
          Transportability
27. [ ] [ ] Software
28. [ ] [ ] Test Requirements/Procedures

Yes/No

29. [ ] [ ] Retest/Requalification
30. [ ] [ ] Retrofit/Modification
          Instructions(MIs)
31. [ ] [ ] Cost *
32. [ ] [ ] Schedule
33. [ ] [ ] Kit/MI Validation
34. [ ] [ ] Kit Proofing/MI Verification
35. [ ] [ ] Mockup/Simulators
36. [ ] [ ] Gov't Furnished Property
          [ ] GFE
          [ ] GFM
          [ ] GFD
37. [ ] [ ] Phase 1 Contract
38. [ ] [ ] Prime Contract
39. [ ] [ ] Product Group Contract
40. [ ] [ ] PG Tier II Subcontracts
          [ ] PG–1 Subs
          [ ] PG–2 Subs
          [ ] PG–3 Subs
          [ ] LMSC (FGB)
41. [ ] [ ] On–Orbit Operations
          [ ] EVA
          [ ] EVR
          [ ] IVA
42. [ ] [ ] Launch Operation
          [ ] Element Processing
          [ ] Ground Processing
          [ ] Shuttle
43. [ ] [ ] Others (Specify)
          [ ] _____
          [ ] _____

15. How Affected (All Block 14 "Yes" Items):

*31. See Cost Summary (To be provided by Prime Finance / Program Control)

1. SSCN	Space Station Change Memo	Page 4 of

16. Configuration Items Affected:

End Item	Nomenclature	Effectivity

17. Change Coordination (Indicated by Team and Name):

18. Description of Implementation Tasks (Ref. the "Team Impacts Form")

19. Continuation Block (Use Additional Pages as Necessary):

TEAM IMPACT IDENTIFICATION FORM

ISSUE DEFINITION TITLE:

[ ] **System AIT**
    [ ] **System Engineering & Analysis AIT**
    [ ] **Integrated Risk Management AIT**
    [ ] **Integration Test & Verification AIT**
    [ ] **Configuration Management AIT**

[ ] **Business Management AIT**
    [ ] **Program Baseline Acquisition & Allocation AIT**
    [ ] **Program Control & Performance Measurement AIT**
    [ ] **Information System AIT**

[ ] **Vehicle IPT**
    [ ] **LP/S Phase 1 IPT Shuttle/MIR**
    [ ] **LP/S Team 1 IPT RSA**
    [ ] **LP/S Team 2 IPT Node/Cupola/ Airlock**
    [ ] **LP/S Team 3 IPT Lab/Hab**
    [ ] **LP/S Team 4 IPT Integrated Truss/MSS**
    [ ] **LP/S Team 5 IPT PV Module**
    [ ] **LP/S Team 6 IPT JEM/APM**
    [ ] **Subsystem Provider Team 7 IPT**
    [ ] **Ground Facilities Team 8 IPT**
    [ ] **Vehicle AIT**
        [ ] **Vehicle Test & Verification AIT**
        [ ] **Vehicle Requirements AIT**
        [ ] **Vehicle Analysis AIT**
        [ ] **Vehicle Effectiveness AIT**
        [ ] **Subsystem Architecture & Analysis AIT**
        [ ] **Vehicle Integration AIT**

[ ] **Safety & Mission Assurance IPT**
    [ ] **Safety & Mission Assurance AIT**
    [ ] **Safety IPT**
    [ ] **Reliability &Maintainability IPT**
    [ ] **Quality Assurance IPT**

[ ] **Utilization IPT**
    [ ] **Utilization AIT**
    [ ] **Research Accommodations IPT**
    [ ] **Utilization Integration & Planning IPT**

[ ] **Operations IPT**
    [ ] **Operations AIT**
    [ ] **Station Mission Operations IPT**
    [ ] **Logistics & Maintenance IPT**
    [ ] **Operations Planning & Cargo Integration IPT**
    [ ] **Launch Site Processing IPT**
    [ ] **Assembly Operations AIT**
    [ ] **Station Astronaut AIT**

[ ] **International Partners**
    [ ] **CSA**
    [ ] **ESA**
    [ ] **NASDA**
    [ ] **RSA**
    [ ] **ASI**

[ ] **Phase 1 Program Manager**
    [ ] **WG–0**
    [ ] **WG–2**
    [ ] **WG–3**
    [ ] **WG–4**
    [ ] **WG–5**
    [ ] **WG–6**
    [ ] **WG–7**
    [ ] **WG–8**

[ ] **Prime Product Groups**
    [ ] **PG–1**
    [ ] **PG–2**
    [ ] **PG–3**
    [ ] **LMSC**

[ ] **Others (List)**
    [ ]
    [ ]
    [ ]
    [ ]

SSP 50123

ATTACHMENT C TO APPENDIX C
SSCN CANCELED/SUSPENDED/WITHDRAWN FORM

SSCN Canceled/Suspended/Withdrawn Form

Change Type and #

Title:

Reason:

<u>**Concurrence:**</u>

Change Integrator: _____

Change Engineer: _____

Technical Compliance: _____

Change Mgt. Team Lead: _____

VAIT Chairman – Prime: _____

VAIT Chairman – NASA: _____

ATTACHMENT D TO APPENDIX C
ISSUE DEFINITION TRANSMITTAL FORM

ISSUE DEFINITION TRANSMITTAL FORM

The Issue Definition package provides advance notification to Materiel and Contracts of VAIT authorization to proceed with Proposal Preparation.

SSCN: _____   **TITLE:**_____

CHANGE ENGINEER: _____   **PHONE#:** _____

CHANGE INTEGRATOR: _____   **PHONE#:** _____

TO:

HF–96/Todd Standlee (PG–1)
HF–96/Chuck Adams (PG–2)
HF–96/Ken Crabtree (LMSC)
HS–40/Mark Williams (PG–3)
HS–40/Kyle Dickehut (Prime Contracts)
HS–30/Brad Cohen (Requirements Team)
HS–30/Kevin Brown (Subsystem Architecture & Analysis Team)

PRODUCT GROUP(S) AFFECTED: [   ] PG–1   [   ] PG–2   [   ] PG–3   [   ] LMSC

TYPE OF CHANGE: [   ] Routine   [   ] Urgent

Please authorize the above PG(s) to support Proposal Preparation for the subject SSCN. Attached is the Issue Definition Change Memo presented to the VAIT.

A Change Integration Planning Meeting to acquire the commited proposal submittal schedule will be held on __(Date)__ at __(Time)__.

Attachments:
[   ] Issue Definition Change Memo
[   ] VAIT Presentation & Synopsis
[   ] Other: _____

Approval: M. Bontz/T. Striegel: _____**DATE:**_____

Form Date: 3/23/95

ATTACHMENT E TO APPENDIX C
INTEGRATED COST SUMMARY FORM

Integrated Cost Summarty Format

This format is to accompany all changes to the VAIT and/or concurrence cycle. The purpose of this format is to provide detailed cost and manpower information so as to facilitate the approval process, and to provide budgeting information which can be used by Program Control to establish cost plans. Cost information contained on this form should include input from the Product Groups or non–prime organization where applicable. The format also requires the name of the responsible sponsoring engineer(s) and estimators. Signature of NASA Program Control and Boeing Finance (for Prime contract change activity) is required prior to approval of the cost estimate.

	Directive Number SSCN:	International Space Station Alpha Integrated Cost Summary	Estimator 1: _____ Phone #: _____ Estimator 2:_____ Phone #: _____
	Title:		Boeing Engineer:
			NASA Engineer:

$ In Millions

	FY:	FY:	FY:	FY:	FY:	FY:	FY:	FY:	Total
PE&I									
PG1									
PG2									
PG2									
Other Subs:									
Prime Cost									
Prime Price									
TMAS									
Shuttle Int									
GFE									
MIS									
Utilization									
Ops/OCD									
Other:									
Non–Prime Cost									
Non–Prime Price									
Total Price Est									

Equivalent Personnel

	FY:	FY:	FY:	FY:	FY:	FY:	FY:	FY:
PE&I								
PG1								
PG2								
PG3								
Other Subs:								
Total Prime								
TMAS								
Shuttle Int								
GFE								
MIS								
Utilization								
Ops/OCD								
Other:								
Total Non–Prime								
Total EP's								

NASA Program Control: _____   Boeing Finance: _____

Date: _____   Date: _____

ATTACHMENT F TO APPENDIX C
NON–PRIME AND PRIME MANAGEMENT REVIEW GUIDELINES

NON–PRIME MANAGEMENT REVIEW

TBD

PRIME MANAGEMENT REVIEW

A Management Review will be conducted before formal submittal to NASA of ROMs, NTEs, or firm estimates. The Management Review will address all aspects of the change (i.e., technical, schedule, contractual, etc.) supporting the pricing submittal. The Management Review participants will include the following managers or assigned delegates:

a. Responsible Product Manager

b. SSAIT Manager

c. Business Manager

d. Program Manager

Other management reviews will be conducted as required in accordance with current Boeing directives.

The suggested format, content, and responsibilities of management reviews are as follows:

a. The Change Integrator will prepare an Agenda and Introduction.

b. The Change Engineer will prepare the Summary Overview which includes the following:

    (1) A description of the technical approach, which could include sketches and other material necessary to convey an understanding of the technical aspects of the change.

    (2) The proposal and implementation schedules provided by the Program Definition and Change Integration AIT representative, which could include charts covering proposal submittal and authorization schedules, as well as, implementation schedules showing how the proposal tasks relate to each other, to other related changes, and to the baseline program. Additionally, if subcontractors are affected, a comprehensive schedule describing submission of proposals, cost analyses, negotiations, and subcontractor implementation schedules will be included.

    (3) A summary of the NASA's view on the proposal/deltas, including all significant information regarding the NASA position on the change undergoing management review, if known, which includes items such as the availability of funds and customer schedules/requirements. Additionally, this section will identify any areas that differ from the IPT's inputs on costs, schedules or resources, or differ from the SOW provided by NASA.

c. The Change Engineer will provide Proposal Ground Rules to summarize the information/decisions which provides the basis of the proposal's detailed estimate.

d. Supplemental Information will be developed by the Change Engineer to provide a summarized review of information that management may require to consider the proposal for submittal to NASA. This may include the following:

    (1)   Make/buy decisions (including a summary of items and approximate dollar amount of the work to be assigned to the "make" category)

    (2)   Any unique support organization or facility requirements, including unique Boeing, Government, and associate contractor support requirements, including support required from other Boeing programs/divisions via interdivisional work authorization/ product support authorizations

    (3)   A discussion of all unique resource requirements for the implementation of this change, such as the following:

        — New capital assets/existing company resources

        — GFP assets/use of Government facilities and their ability to provide them

        — Additional staffing requirements

e. Cost Overview and Analysis will be provided by the Finance organization and will include the following:

    (1)   Cost Data – The presentation of the proposal cost data will include, as a minimum, the following information:

        — Cost breakdown by IPT and identification of cost drivers

        — Presentation of the final cost and price summaries submitted to the customer

    (2)   "Should" Cost – As determined by the Finance organization in regards to availability and applicability, "should cost" data that will validate the proposal will be presented. This data will include, as a minimum, the following:

        — Estimating rationale and/or parametric check for all cost elements. (This will demonstrate to management that the costs of the proposed tasks are well understood, and that the reasonableness of the costs are verified through parametric checks or comparison with similar negotiated proposals or documented estimates.)

        — Comparison with previously submitted data for this proposal. (This will include data from previous ROM and NTE submittals for this proposal, if applicable.)

f. The Change Engineer will provide program management with an overall Risk Assessment associated with the subject proposal. The risk assessment will include areas such as technical, cost, and schedule. The risk assessment is the Change Engineer's along with Risk Management's judgment of the program's ability to successfully accomplish the activities proposed. For the Space Station Program, this judgment will be categorized for management visibility as follows:

    (1)   Low: Declaring a category as "low" risk tells management that the program has an 80 percent or higher probability of success.

    (2)   Medium: Declaring a category as "medium" risk tells management that the program has a 50 percent to 80 percent probability of success.

    (3)   High: Declaring a category as "high" risk tells management that the program has less than a 50 percent probability of success.

g. When risk categories other than "low" are identified, the Change Engineer will present a risk abatement plan to minimize the risk. The following areas will be addressed in the risk assessment:

    (1) Cost

    (2) Schedule

    (3) Technology

    (4) Manpower/Staffing

h. Contractual Considerations (Contracts) – The presentation of the technical portion of the proposal should cover the transmittal letter (if applicable) and any contractual changes. As required, the contracts organization will provide the identification of premises, qualifications, new or revised contract terms, conditions (to include CLINs and articles, or special provisions), unique delivery requirements, and contractual documents affected.

i. After the presentation, the Change Engineer will provide program management with a Summary of the management review results, including any action items required to submit the proposal. The summary will also cover all areas of planning for the submittal and authorization of the proposal, including identification of any higher–level reviews required.

j. Based upon successful completion of the Boeing prime management review, the applicable price estimate will be submitted to NASA. The Contracts representative is responsible for this submittal.

ATTACHMENT G TO APPENDIX C
SPACE STATION CHANGE EVALUATION/IMPACT ASSESSMENT
FORM AND PREPARATION INSTRUCTIONS

An ISSA Change Evaluation/Impact Assessment will be prepared by all mandatory evaluators for all proposed changes to the program requirements baseline. Non–mandatory evaluators should submit a Change Evaluation/Impact Assessment if impacts are identified. If the information required by the form is adequately provided in the data package accompanying the proposed change, the information need not be restated on the form itself but may be summarized and/or identified on this form with a reference to the appropriate backup document and paragraph. Continuation sheets will be used as necessary.

Use the following instructions to complete each block on the form:

1. SSCN – Enter the same SSCN number that appears on the ISSA Change Memo to be evaluated. A suffix (e.g., R1, R2, R3, etc.) will be added to the SSCN to identify revised Change Evaluations.

2. Page – Enter page numbers as applicable.

3. Organization – Enter the IPT/AIT/organization originating the evaluation/impact.

4. Title – List the same title that appears on the PCM.

5. Team Items Impacted – Check to identify which elements will impact your IPT/AIT/organization by the proposed change. Identify the cause of the impact (what and why) in Block 6. If no items are affected, check Item 43, "Other," and write in "NO IMPACT."

6. Impact Description – Provide a description of each of the items impacted in Block 5 and the basis for the impact. If "NO IMPACT" was listed, list "NO IMPACT" in this block.

7. WBS – List the primary element(s) of the WBS to be affected by the change. List by the designated WBS number and title, implementation task to be performed, scheduled completion date or milestone when the task will be completed, and if the task is a Non–Prime (NP) or Prime (P) task.

Note: If no tasks are identified by your IPT/AIT/organization list "NONE" in this block.

8. Configuration Items Affected – List the CI Number, CI Nomenclature, and the effectivity for the CIs affected by the proposed changed.

Note;   Effectivity is to be listed by CI Serial Numbers (Example: All, SN00001, SN00003 and Up, SN00002 thru SN00004).

Note: If no CIs are affected list NONE in this block.

9. Remarks – Include any remarks pertinent to the proposed change. If NASA IPT/AIT evaluations include a cost impact for NASA Program Participants, include a statement to indicate the cost package is attached to the evaluation form.

10. Evaluated By – Identify the Change Evaluator(s) and provide their phone numbers.

11. Concurrence By – The Change Evaluation/Impact Assessment will be concurred to by the authorized representative for the IPT/AIT/Organization identified in Block 3 for their respective Prime/Non–Prime tasks. If the concurrence is at the IPT/AIT level, both Co–Team Leaders must sign the Change Evaluation/Impact Assessment Form. If the evaluation/impact is from an International Partner only one signature is required. For Class I changes concurrence also includes "From/To's" to contractual documentation that is coordinated with the Requirements Development Team Focal prior to submittal from that team.

    Date Signed – Include the date that the evaluation/impact is signed.

NOTE: Remaining/additional information can be provided on a continuation sheet. Include the SSCN number, page number, IPT/AIT/organization, and title on each page.

Space Station Change Evaluation/ Impact Assessment Form	1. SSCN	2. Page 1 of
	3. Organization:	

4. Title:

5. Team Items Impacted:

Yes/No		Yes/No		Yes/No	
1. [ ] [ ]	Specifications	21. [ ] [ ]	Spares and Repair Parts	37. [ ] [ ]	Phase 1 Contract
2. [ ] [ ]	ICDs/IRDs	22. [ ] [ ]	Operational and Maintenance	38. [ ] [ ]	Prime Contract
3. [ ] [ ]	Document/Specification Tree		Manuals	39. [ ] [ ]	Product Group Contract
4. [ ] [ ]	Part Number/Serialization	23. [ ] [ ]	Facilities	40. [ ] [ ]	PG Tier II Subcontracts
5. [ ] [ ]	Performance	24. [ ] [ ]	Support Equipment		[ ] PG–1 Subs
6. [ ] [ ]	Resources	25. [ ] [ ]	Training/Training Equipment		[ ] PG–2 Subs
7 [ ] [ ]	Safety	26. [ ] [ ]	Packaging/Handling/Storage/		[ ] PG–3 Subs
8. [ ] [ ]	Survivability		Transportability		[ ] LMSC (FGB)
9. [ ] [ ]	Reliability	27. [ ] [ ]	Software	41. [ ] [ ]	On–Orbit Operations
10. [ ] [ ]	Maintainability	28. [ ] [ ]	Test Requirements/Procedures		[ ] EVA
11. [ ] [ ]	Service Life	29. [ ] [ ]	Retest/Requalification		[ ] EVR
12. [ ] [ ]	Environments	30. [ ] [ ]	Retrofit/Modification		[ ] IVA
13. [ ] [ ]	Parts, Materials,& Processes		Instructions(MIs)	42. [ ] [ ]	Launch Operation
14. [ ] [ ]	Critical Single Point Failure Items	31. [ ] [ ]	Cost		[ ] Element Processing
15. [ ] [ ]	Commonality	32. [ ] [ ]	Schedule		[ ] Ground Processing
16. [ ] [ ]	Verification Plans	33. [ ] [ ]	Kit/MI Validation		[ ] Shuttle
17. [ ] [ ]	Software Development and	34. [ ] [ ]	Kit Proofing/MI Verification	43. [ ] [ ]	Others (Specify)
	Integration Laboratory (SVF, MBF)	35. [ ] [ ]	Mockup/Simulators		[ ] _____
18. [ ] [ ]	ILS Plans	36. [ ] [ ]	Gov't Furnished Property		[ ] _____
19. [ ] [ ]	Logistics Support Analysis		[ ] GFE		[ ] _____
20. [ ] [ ]	Maintenance Plans/Procedures		[ ] GFM		[ ] _____
			[ ] GFD		

6. Impact Description:

7. WBS#   Title   Task   Schedule   Milestone   NP/P
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

8. Configuration Items Affected:
        CI#   CI Nomenclature   CI Effectivity

9. Remarks:

10. Evaluated By: _____   **PH#:** _____

11. Concurrence By: _____   **Date Signed:** _____
        Concurrence By: _____   **Date Signed:** _____

Space Station Change Evaluation/ Impact Assessment Continuation Form	1. SSCN	2. Page of
	3. Organization:	

4. Title:

ATTACHMENT H TO APPENDIX C
VEHICLE MASTER DATA BASE (VMDB) IMPACT FORM

Use the following instructions to complete the VMDB Impact form.

1. Each part must be identified individually for items which require separate power, data or thermal channelization, otherwise quantity may be used.

2. All information filled in by the Change Engineer (must be coordinated with System & Resource Teams responsible for information).

3. Table must be completed prior to VIPT approval. Any change in table must be approved by VIPT prior to incorporation.

4. Table definitions/instructions:

Column	Definition	Legal Values
1	Changes: Addition, Modification or Deletion to VMBD	A=Added, M=Modified, D=Deleted
2 & 3	Beginning and ending flight effectivity of the addition, modification or deletion	Reference SSP 50017, Section 3, Figure 3–I Assembly Sequence and Manifest
4	Subelement in which the part identified is located	Reference SSP 50017, Section 2.3, Figure 2–II Assembly Sequence and Manifest
5	Design Maturity of the Part	DES, DEV, TEST, COTS
6	Part number identified either from the VMDB or from data supplier (PG, IP, etc.)	Blank for added parts, actual P/N for modified or deleted parts
7	Part instance identification as found in the VMBD. This is the instance identifier for a specific part in the Indentured Parts List (IPL) from the VMDB to be modified or deleted. If not provided, then the comments section should include enough information to uniquely identify a specific/individual part in the IPL.	As identified from VMDB "Working" version. If not known, then enough information concerning location, name, system, etc., must be provided to uniquely identify the specific part.
8	Name of the part to be added, modified or deleted. For added parts, this is the name to be tracked in the VMDB until the supplier (PG, IP, etc.) provides actual data. For modified or deleted parts, this is a descriptive name to aid in the identification of a specific/individual part in the IPL.	Alphanumeric Characters. A–Z, 0–9, –0, _. (,), /

9	Physical location of the part. If resident within a subelement, this information may remain blank.	Reference SSP 50575, Space Station Interior & Exterior Operational Location coding System
10	Quantity of parts per subelement. Used only if power, data or thermal channelization is not required.	Integer value
11	Primary system, to which the part is associated.	C&DH, C&T, EPS, EVAS, FCE, GNC, TCS, LS, CHeCS, LPI, MSS, PROP, S&M
12	Launch weight of the part in pounds	Real number (format=XXX.XX)
13	Amount of power the part requires under nominal loading.	Real number (format=XXX.XX)
14	Thermal cooling method the part requires.	CA, AA, LT, MT, EA, EB, PV, PE (Reference SDS/SDRL VE046)
15	Additional comments the Change Engineer can provide to assist in the incorporation of the change into the VMDB.	

Team _____   Name _____

VMDB Impacts

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CHG	BEG FLT	END FLT	SE	DEV	P/N	INST	PART NAME	LOC	QTY	SYS	LNC WT	NOM PWR	TH	COMMENTS

Team _____   Name _____

**ATTACHMENT I TO APPENDIX C
CHANGE COMMITMENT RECORD
FORM AND PREPARATION INSTRUCTIONS**

CHANGE COMMITMENT RECORD (CCR) DEVELOPMENT

The CCR will be used to document the Program level IPT/AIT commitments to support the design, development, test, and delivery of all IPT/AIT products and associated documentation. The CCR will document changes and develop the most expedient, cost effective incorporation plan and commit the Prime IPT/AIT members to this specific plan. The CCR serves as the authorization for revisions to all impacted schedules.

The commitment forms, events, and revision controls are the same for both. The Prime IPT/AIT members have the responsibility to develop, negotiate, commit, and document their events using the CCR as a formal commitment record.

CHANGE COMMITMENT RECORD APPLICABILITY

This procedure is applicable to all ISS Program level IPT/AIT members and details how the IPTs/AITs will document their basic/change incorporation commitments on the CCR. The CCR commitment function is within the control of the Program level IPT/AIT with the team planner acting as the focal point. The IPT may choose how they want to accomplish this activity within the general constraints of this procedure.

CONTENT AND USE

A CCR will be committed for each change and contain a detailed commitment schedule covering each deliverable item and each authorized nondeliverable item. In addition, there will be a system–level detailed schedule commitment for those items which are not directly associated with a single item of hardware and/or software.

Specific CCR commitments will vary by IPT/AIT. However, as a rule, commitments must cover all activities necessary to complete a task from design to delivery, as applicable. In addition, the CCR should identify all activities required and/or authorized before the appropriate contractual incorporation point [i.e., Critical Design Review (CDR), FCA, PCA, etc.].

This data will be recorded and tracked using CACTIS. A "CACTIS Users Guide" will provide the details for entering CCR data into the system.

The approval of the IPT/AIT Leader (or his/her delegate) is required before the release and distribution of a CCR. When multiple IPTs/AITs are impacted a "flow up" to a higher AIT level for coordination and approval will be required.

IPT/AIT ROLES AND RESPONSIBILITIES

Each IPT/AIT team has members from the various functional disciplines. Each brings a unique and necessary expertise to the team plus the authority to commit their discipline to a "course of action." Accordingly the following roles and responsibilities are presented by discipline.

THE IPT/AIT LEADER WILL:

a. Co–chair the IPT CCR commitment process and approve for release all CCR commitments.

b. Ensure program coordination of CCR interfaces is accomplished and documented by the IPT and AIT.

THE CM AND DATA MANAGEMENT IPT MEMBERS WILL:

a. Coordinate, maintain, and publish the PCM and the CCM. The PCM and CCM will identify impacted PEIs, CIs, and any recommended activity. The PCM will define the IPT products and tasks required to support baseline requirements. The CCM will provide a complete document that the IPTs and support organizations will use to generate CCR commitments and pricing estimates.

b. Provide Data Management, Technical Compliance, Specification Management, Change Management, and Release Records commitments, representation and status.

c. Establish and provide/coordinate with the IPT CI/CSCI and PE&I baseline requirements.

d. Support Configuration Status Accounting requirements.

e. Identify and commit events in support of design reviews, configuration audits, and product certification, as well as verification of the completeness and accuracy of the published milestones.

f. Ensure that the appropriate level of IPT/AIT review and authorization is accomplished.

g. Ensure all necessary Engineering design release tasks are input by WBS and "roll up" to reflect delivery requirements.

THE ENGINEERING IPT MEMBER WILL:

a. Support preparation of commitment development flow charts and schedules.

b. Commit final Engineering Release Completion Record (ERCR) releases for each end item identified on the effectivity page and for the closure of the change.

c. Commit drawing and documentation release dates by part number and WBS (PEIs, CIs, and CSCIs require part number assignments).

d. Identify and commit IPT interface and test requirements.

THE TEAM PLANNER WILL:

a. Develop a change implementation schedule.

b. Co–chair the schedule commitment activity with the IPT/AIT Leader to develop the CCR. Ensure the CCR includes PEI and product numbers used on's and CI/CSCI with a "roll up" to the deliverable requirements.

c. Update impacted program and IPT schedules, as required, based upon the CCR, after the change has been authorized.

d. Ensure CCR commitments support program schedules.

e. Provide an electronic copy of CCR to Change Integrator for attachment to CCM and to be uploaded into PALS.

f. Maintain a central master of committed CCRs.

g. Commit Government–Furnished Property (GFP) availability.

h. Commit requirements for special test equipment requests.

THE PROGRAM BASELINE ACQUISITION AND ALLOCATION AIT MEMBER WILL DO THE FOLLOWING:

a. Review and coordinate IPT commitment development flowcharts.

b. Provide procurement flow times and commitments for placement of subcontract/supplier contract awards, testing and availability of procured materiel, hardware, software, and data.

THE SAFETY AND MISSION ASSURANCE IPT MEMBER WILL DO THE FOLLOWING:

a. Identify and commit events in support of First Article Inspection, FCA, and PCA activities.

b. Commit configuration summaries for deliverable hardware in support of the delivery process.

CHANGE COMMITMENT RECORD REVISION CONTROL

Upon signature, the CCR commitments are under formal change control. All changes to commitments require a controlled change. Controlled changes may be through a Request For Recommitment (RFR) or CCM revision. See Attachment A for Format and Preparation Instruction for CCM Revisions.

REQUEST FOR RECOMMITMENT

When the IPTs CCR commitments recorded require a correction due to an error, oversight, or omission, an RFR may be initiated. The RFR must be within the scope of the existing CCM. Upon determination of the need to process an RFR and completion of the RFR form (see Attachment B) by the initiating IPT member, it will be forwarded to the PP&C member of that IPT to log and assign a control number. PP&C will then route the RFR to the appropriate IPT/AIT Leader for review to ensure that the requested change is a valid CCR and not a new change, supplemental release, or relief from delinquent commitments. Upon successful completion of the disposition/review process by the IPT/AIT Leader, the IPT will coordinate and commit a revised CCR for release.

If the IPT/AIT Leader dispositions the RFR as not acceptable, it will be returned to PP&C with a detailed justification for its rejection. PP&C will log out the RFR and return it to the originator.

NOTE: In the following two unique situations, RFRs are not required to correct or revise CCR commitments:

a. If a clerical error (spelling, typo) is identified by the IPT, PP&C can revise the released CCR without an RFR. The CCR will "roll" to the next revision level reflecting the change.

b. If a schedule change request is processed to reschedule a program controlled and prime managed milestone or program schedule milestone, it can recommit the corresponding and/or supporting CCR event. The CCR will "roll" to the next revision level reflecting the change.

This attachment provides specific instructions for the formatting, data contents, and preparation of the CCR.

Use the following instructions to complete each block on the form:

1. SSCN –

2. Change No. – Include the complete number as it appears on the appropriate CCM.

3. Title – Record as much of the title as will fit in the space provided as taken from the CCM. Abbreviations should be used only as required by space restrictions.

4. Type of Estimate – ROM/NTE/FIRM

5. Prime Contact –

6. Change Engineer –

7. Change Manager –

8. Change Integrator –

9. Contract/RFP –

10. Authorizing Paper –

11. Proposed/Firm –

12. CEI/CI/Affected CSCI –

13. Date –

14. IPTs Affected –

ISSA CHANGE COMMITMENT RECORD

⑬ Date _____   Page___ of ___

① SSCN _____

② Change Number _____

③ Title _____

④ Type of Estimate ROM_____ NTE_____ Firm _____

⑤ Prime Contact _____ Phone _____

⑥ Change Engineer _____

⑦ Change Manager _____

⑧ Change Integrator _____

⑨ Contract/RFP _____

⑩ Authorizing Paper _____

⑪ Proposed _____ Firm _____

⑫ CEI/CI/Affected _____
     CSCI
                        _____

     WBS Number _____

Milestone	SCH	ECD	ACT
PCM CMRD			
PCM			
Tech Approval			
PCM Update			
CCM			
ECE to FIN			
Matl to FIN			
Other to FIN			
FIN to Contracts			
SSAIT/SSVAIT			
PRB			
Submittal			
F/F			
NEG			
SSCB			
S/A			
Engr. Complete			
Matl. Complete			

⑭ IPTs Affected: _____ _____ _____
     Approval Signatures
                      _____ _____ _____

                      _____ _____ _____

NUMBER _____ **TITLE** _____ **PAGE** _____

ENGR/CCR COMMITMENTS

PROPOSED _____ **FIRM** _____

ITEM NO.	ERCR/ NON ERCR	NOMENCLATURE	RELEASE NUMBER	RESP. ENGR.	RELEASE TYPE	DATE TO ERU	ERU RELEASE	CI/CSCI	EFFEC.	ERCR STATUS
1 THRU 25										

NUMBER _____ TITLE _____ PAGE _____

PROPOSED _____ FIRM _____

MATERIEL

PRODUCT GROUP	P/N	DESCRIPTION	HWD	SW	DATA	GFP	CAP	DIL	AIL	DATE	QTY
1 THRU 10											

OTHER

REMARK/SPECIAL INSTRUCTIONS

ATTACHMENT J TO APPENDIX C
INTERNATIONAL SPACE STATION ALPHA PRIME CHANGE DIRECTIVE
FORM AND PREPARATION INSTRUCTIONS

General Instruction

The Prime CD is used by the ISSA Program to disposition Class II Changes. The CD may include instructions/actions for change implementation, funding requirements, schedule milestone requirements, Space Station resource allocation, and implementation effectivity.

Use the following instructions to complete each block on the form:

1.   Directive Number SSCN – The Prime Change Management Team Member will enter the Directive Number, which will contain the SSCN of the PCM/CCM being dispositioned. If the Directive is not preceded by a PCM/CCM, an SSCN will be assigned.

2.   IPT/AIT/Board – Identify the Program level IPT/AIT/Board dispositioning the change and the date of the board meeting. If there is not a formal meeting, put "OSB" in this block

3.   Revision – Identify the revision level of the directive with a notation of R1, R2 etc. The revised directive will supersede the previous directive in its entirety. The directive revision level will be verified with the status accounting records and/or Master Change File.

4.   Page – Enter page numbers as applicable. Each continuation page or attached material will be consecutively numbered from the first page of the directive.

5.   Title – The change title will be the same as the PCM/CCM or the same as the SSCN log title if no PCM/CCM has been initiated.

6.   Directions: Identify the disposition of the change and direction for implementation. Enter the direction using one of the following templates.

      This directive authorizes immediate implementation of XXX prior to TCP preparation and approval. Materiel and Contracts are to flow this direction down to PG–1, PG–2, and PG–3.

7.   Cost Impact – Provide approved consolidated cost for implementation of the CD. For total cost less than or equal to $999,999, each block will be designated in "Thousands" (K). For total costs of $1,000,000 or greater, each block will be designated in "Millions" (M). No cost will be designated N/A. Cost savings or cost avoidance will be shown in parenthesis ( ).

8.   Background/Reason for Directive – Provide a brief but descriptive reason why the directive or revised directive is needed. Describe all activities leading to the situation which resulted in this directive. Identify any customer contacts, references or other correspondence that may be pertinent.

Note: When processing a revised directive, the revision indicator should be included as part of Block 8 Title (i.e., Background/Reason for "R1" directive).

9.   Directive Approval – Indicates signature by appropriate IPT/AIT Prime Chairman and others as determined appropriate by the CMAIT Member of the IPT/AIT.

10.   Previous Directive Approvals – When a revised directive is processed the previous directive approvals, by name and date, will be carried forward to this block as electronic signatures. This will include reason for directive and background summary. This summary information will be carried forward to all subsequent revisions.

    (1) Revisions to directives will be identified by R1, R2, etc.

    (2) The revised directive will carry forward all information from the previous version. Any information that is being added, deleted, and or revised will be identified with the appropriate revision indicator in the left hand margin. A line may be drawn between revision indicators when appropriate.

1. Directive Number SSCN:	**Prime Change Directive**	2. IPT/AIT/Board/Date:
3. Revision:		4. Page: _____ of _____

5. Title:

6. Direction:

7. Cost Impact	FY 95	FY 96	FY 97	FY 98	FY 99	Balance to Completion	Total Cost
DEV:	$	$	$	$	$	$	$
OPS:	$	$	$	$	$	$	$

8. Background/Reason for Directive:

9. Directive Signature:

_____
Prime VIPT Co–Lead / Date

Form Date: 8/5/84

Prime Change Directive Continuation Page	1. **Directive Number/SSCN:**
	2. **Revision:**
	4. **Page Number:** _____ of _____

10. Previous Directive Approvals

Background/Reason For Directive:

Directive Approval:

_____
Prime VIPT Co–Lead / Date

Background/Reason For R1 Directive:

R1 Directive Approval:

_____
Prime VIPT Co–Lead / Date

Background/Reason For R2 Directive:

R2 Directive Approval:

_____
Prime VIPT Co–Lead / Date

Prime Change Directive Continuation Page	1.Directive Number SSCN:
	2. Revision:
	4. Page Number: _____ of _____

ATTACHMENT K TO APPENDIX C
INTERNATIONAL SPACE STATION ALPHA PROGRAM CHANGE DIRECTIVE
FORM AND PREPARATION INSTRUCTIONS

General Instruction

The CD is the official document used by the ISSA Program to disposition a NASA/Prime baseline change. It is the sole authority for changing the NASA formal Space Station configuration baselines. Changes of administrative nature may be approved by the Executive Secretary to the SSCB. The CD may include instructions/actions for change implementation, funding requirements, schedule milestone requirements, Space Station resource allocation, and implementation effectivity.

Use the following instructions to complete each block on the form:

1.   Directive Number SSCN – The Prime Change Management Team Member will enter the Directive Number, which will contain the SSCN of the PCM/CCM being dispositioned. If the Directive is not preceded by a PCM/CCM, an SSCN will be assigned.

2.   IPT/AIT/Board – Identify the Program level IPT/AIT/Board dispositioning the change and the date of the board meeting. If there is not a formal meeting, put "OSB" in this block

3.   Revision – Identify the revision level of the directive with a notation of R1, R2 etc. The revised directive will supersede the previous directive in its entirety. The directive revision level will be verified with the status accounting records and/or Master Change File.

4.   Page – Enter page numbers as applicable. Each continuation page or attached material will be consecutively numbered from the first page of the directive.

5.   Title – The change title will be the same as the PCM/CCM or the same as the SSCN log title if no PCM/CCM has been initiated.

6.   Baseline Documents Affected – Identify the established baseline documents affected by number, title, and current revision. All Program level NASA baseline documents affected will be identified in Block 6. Other lower level baseline documents that may be listed in the associated CCM as affected will not be listed. For NASA baseline documents with technical content changed (From/To) by the directive, where the documents are shown as applicable to other NASA baselined documents, these documents will also be listed as affected. Example: SSP30XXX, "Design Criteria for EMI", is being changed by the directive and SSP 30XXX is listed in the applicable documents list of SSP 41000, "System Specification", the SSP 41000 will also be shown in Block 6.
When a directive changes the CM controlled portion of NASA contracts [i.e., SOW, ADL, Deliverable Item List (DIL), GFE list, etc.) the contract number and title will be listed in Block 6.

7A.   Directions: Identify the disposition of the change and direction for implementation. Enter the direction using one of the following templates. The following list represents most of the directions needed for directives. Modify the wording as necessary to accommodate

special needs. When changes are attached to a directive, the changes must be clearly identified. From/To changes will have change bars to denote what changed, or will be highlighted by approved conventions for SCNs, DCNs, etc.

(1)   If a Directive approves a CCM with modifications, then the modifications to the CCM must be defined in Block 7A of the Directive.

(2)   If the Directive approves a Non–Prime PCM (There is no CCM), the Block 7A lead in paragraph should read:

 a. SSCD XXXXXX is issued to approve PCM XXXXXX dated _____ as written and to authorize changes to (enter document number and title) as defined in the PCM.

<div align="center">OR</div>

 b. SSCD XXXXXX is issued to approve with modifications, PCM XXXXXX dated _____ and to authorize changes to (enter document number and title) as defined herein (or as defined in the attached DCN_____).

NEW DOCUMENT APPROVAL
SSCD XXXXXX is issued to approve (approve with modifications) Composite Change Memo XXXXXX and to baseline (enter document number and document title) as an ISSA Program Requirements Document.

CHANGE DOCUMENT APPROVAL
SSCD XXXXXX is issued to approve (approve with modifications) Composite Change Memo XXXXXX and to authorize the changes to (enter document number and document title) as defined in the CCM.

AUTHORIZE PUBLICATION OF SCN
SSCD XXXXXX is issued to approve Composite Change Memo XXXXXX and to authorize publication of the SCN to (enter document number and document title) as defined in the CCM.

DEFER DISPOSITION
SSCD XXXXXX is issued to defer final disposition of Composite Change Memo XXXXXX pending (state reason for deferral, ex. completion of actions specified subsequently).

DISAPPROVE CCM
SSCD is issued to disapprove Composite Change Memo XXXXXX.

APPROVE DESIGN DECISION PACKAGE
SSCD is issued to authorize implementation of Design Decision Package XXX

AUTHORIZE WAIVER
SSCD XXXXXX is issued to approve Composite Change Memo XXXXXX and to authorize a waiver of the requirements contained in (Enter the document number, title, and specific paragraph of the requirement being waived. Specify the effectivity of the waiver [i.e., this waiver is effective for assembly Flight 2 only])

AUTHORIZE DEVIATION
SSCD XXXXXX is issued to approve Composite Change Memo XXXXXX and to authorize a deviation from the requirements contained in (Enter the document number, title, and specific paragraph of the requirement being deviated. Specify the effectivity of the deviation [i.e., this deviation is effective for assembly Flight 2 through Flight 4])

ASSIGN ACTIONS
SSCD XXXXXX is issued to assign the following actions (specific actions to follow). (This may be combined with any other direction identified above.)

CORRECT ERRORS
SSCD XXXXXX (enter revision number) is issued to correct errors on SSCD XXXXXX as identified herein.

REVISE DIRECTIVE
SSCD XXXXXX (enter revision number) is issued to revise directive SSCD XXXXXX as specified herein.

7B. Program Impact
If the total approved cost in Block 8 must be broken down into subelements (i.e., by NASA budget authority, WBS number or Prime Non–Prime costs, etc.) then this breakout may be shown in Block 7B and labeled appropriately. If extensive breakout is required then attach a separate schedule to the directive and make reference to it in Block 7B. Enter the appropriate impacts for schedule, power, mass properties, and volume. If there is no impact, enter "None."

Example
Mass Properties: 1289.3 lbs MB–1 thru MB–7
Schedule: None

7C. Actions
Action items will not add or modify the "Directions" defined in Block 7A or 7B. Block 7A or 7B must define all allocated requirements, approved cost or resource by a breakout suitable for implementation. Actions – Enter the actions necessary to close the directive. Each action will include allocated/approved cost/resources. An action will also be assigned for contract direction to be issued within five (5) days of directive approval. The following represents most of the actions needed for directives. Modify the wording as necessary to accommodate special needs.

Action: 1–1
Actionee: NASA ISSA Procurement Office, OG11
Action: Revise (document number) in accordance with this directive.
Due Date: Five (5) days after directive signature.

No Actions – If no actions are necessary on the directive, the directive needs to state: "No formal actions are assigned by this directive".

8. Total Approved Cost – Provide approved consolidated cost for the implementation of the CD. For total costs less than or equal to $999,999, each block will be designated in

"Thousands" (K). For total costs of $1,000,000 or greater, each block will be designated in "Millions" (M). No cost will be designated N/A. Cost savings or cost avoidance will be shown in parenthesis (). Cost avoidance must be explained in Block 7B.

9.   Background/Reason for Directive – Provide a brief but descriptive reason why the directive or revised directive is needed. Describe all activities leading to the situation which resulted in this directive. Identify any customer contacts, references or other correspondence that may be pertinent.

Note: When processing a revised directive, the revision indicator should be included as part of Block 9 Title (i.e., Background/Reason for "R1" directive).

10.   Directive Approval – Indicates signature by appropriate IPT/AIT Board Chairman and others as determined appropriate by the CMAIT Member of the IPT/AIT. Signature blocks that are not required for the directive will be shown as N/A.

11.   Previous Directive Approvals – When a revised directive is processed the previous directive approvals, by name and date, will be carried forward to this block as electronic signatures. This will include reason for directive, background summary, whether processed in or outside Board and Board dates. This summary information will be carried forward to all subsequent revisions.

(1) Revisions to directives will be identified by R1, R2, etc.

(2) The revised directive will carry forward all information from the previous version. Any information that is being added, deleted, and or revised will be identified with the appropriate revision indicator in the left hand margin. A line may be drawn between revision indicators when appropriate.

Note: Completed actions from previous versions of the directive will NOT be updated to reflect completion of that action. The program action tracking system will contain the current status of all actions.

(3) Approval authority on revised directives will be the same as the original directive unless determined otherwise by the Change Management Team Leader.

(4) New actions will be numbered from where the previous version of the directive left off.

(5) New actions or revised actions will reference the directive revision that authorized or revised the actions.

1.Directive Number SSCN:	International Space Station Alpha Program Change Directive	2. IPT/AIT/Board/Date:
3. Revision:		4. Page: _____ of _____

5. Title:

6. Baseline Documents Affected:
   Document Number:_____Revision:_____
   Document Title:_____

7.

 a) Direction:

 b) Program Impact:

 c) Actions:

8. Total Approved Cost	FY 94	FY 95	FY 96	FY 97	FY 98	Balance to Completion	Total Cost
DEV:	$	$	$	$	$	$	$
OPS:	$	$	$	$	$	$	$

9. Background/Reason for Directive:

10. Directive Signatures:

_____	_____	_____	_____	_____
NASA/Date	CSA/Date	ESA/Date	NASDA/Date	RSA/Date

_____
ASI/Date

Form Date: 8/5/84

International Space Station Alpha Program Change Directive Continuation Page	1.Directive Number/SSCN:
	2. Revision:
	3. Page Number: _____ of _____

11. Previous Directive Approvals

   Background/Reason For Directive:

   Directive Approval:

_____   _____   _____   _____   _____
NASA/Date   **CSA/Date**   **ESA/Date**   **NASDA/Date**   **RSA/Date**

_____
 ASI/Date

Board / Board Date:

 Background/Reason For R1 Directive:

 R1 Directive Approval:

_____   _____   _____   _____   _____
NASA/Date   **CSA/Date**   **ESA/Date**   **NASDA/Date**   **RSA/Date**

_____
 ASI/Date
 Board / Board Date:

 Background/Reason For R2 Directive:

 R2 Directive Approval:

_____   _____   _____   _____   _____
NASA/Date   **CSA/Date**   **ESA/Date**   **NASDA/Date**   **RSA/Date**

_____
 ASI/Date
 Board / Board Date:

International Space Station Alpha Program Change Directive Continuation Page	1.Directive Number SSCN:
	2. Revision:
	3. Page Number: _____ of _____

International Space Station Alpha Program Change Directive Continuation Page	1.Directive Number SSCN:
	2. Revision:
	3. Page Number: _____ of _____

BLOCK 6 (Continued)
Baseline Documents Affected:

Document Number:_____Revision:_____
Document Title:_____

Document Number:_____Revision:_____
Document Title:_____

Document Number:_____Revision:_____
Document Title:_____

Document Number:_____Revision:_____
Document Title:_____

Document Number:_____Revision:_____
Document Title:_____

Document Number:_____Revision:_____
Document Title:_____

Document Number:_____Revision:_____
Document Title:_____

__ISSA Program CD Concurrence Sheet__

CD Number: _____

SSCN Number: _____

Title: _____

Concurrence/Date

_____
Change Engineer

_____
Change Integrator

_____
Change Management Team Co–Chair

_____
Vehicle IPT/AIT Co–Chair

_____
Operations IPT/AIT Co–Chair

_____
Utilization IPT/AIT Co–Chair

_____
S&MA IPT/AIT Co–Chair

_____
Program Risk Management

_____
International Partners Office – Manager

_____
Space Station AIT Co–Chair

_____
NASA, Contract Engineering

_____
NASA, Program Control

_____
NASA, CMAIT Co–Chair

_____
NASA, Business Management

CD concurrence sheets will be used in the processing of all directives.   Form Date: 9/21/94

CD Checklist

This CD checklist will be used by the Prime Change Management Team to determine if a CD and its attendant change package is complete, accurate, and ready for processing. The accuracy of the Technical Proposal is the responsibility of the Change Engineer. It is mandatory that this checklist be used for each CD. If an item does not apply, it should be marked as N/A.

Checklist: CD _____

___ CD number is on all pages including tables, graphs, figures, and attachments.

___ IPT/AIT board date has been verified through the official minutes, if not OSB.

___ Detailed background/summary of change is provided (sketches, memos, DDPs, related changes). A Brief Executive Summary of Change and Reason for change is provided on OSB Package.

___ Actionee, by name and organization is identified for each action assigned. Action due date has been verified with Actionee (not pertaining to the standard template).

___ Actionee listing on distribution list has been verified.

___ If the CD disposition modified the original Change Memo, modifications have been verified with the Change Engineer and are contained in the Directive.

___ If document is invoked in text, applicable documents section has been included.

___ If adding a document to the applicable document list, it is referenced in the text.

___ From Language: Verify that "From" language is the same as the latest (released) version of the affected documentation.

___ Does the CD close out IPT/AIT board action? A Program Review Action? If so, has an action been documented to close action by title, date, and organization.

___ Cost has been verified. If this is a revision which supersedes a previous CD, new (total) cost should be reflected if applicable.

___ No–cost, cost, cost savings, or cost avoidance has been documented. Cost savings are documented in parenthesis ( ). Thousands are be identified by "K" and millions by "M".

___ Justification of cost are contained in background/summary statement. No TBD cost is included. (ROMs or NTEs are acceptable for consideration.)

___ Paragraph/sections are in numerical order.

___ When deleting a section, the section number is retained and the text is replaced in the "To" language with the word "Deleted" or "Reserved."

___ If deleting a section in text, search has been performed to eliminate all references to that section.

___ Each paragraph to be changed has separate From/To language.

___ Requirements that don't change are not repeated within a paragraph that contains many sentences or subparagraphs (i.e., paragraph 3.4.5, change the 2nd sentence From/To).

___ Applicable documents have current version and date.

___ Highlight changes in "**Bold**" on the Change Directive. Items Referenced or Attached to CD may highlight change by other conventions.

___ Concurrence Sheet
     ___ Space Station Change board Processing
     ___ Outside Board Processing
     ___ Verify signatures required, as applicable

Form Date: 9/21/94

ATTACHMENT L TO APPENDIX C
TECHNICAL PACKAGE
PREPARATION INSTRUCTIONS FOR FIRM PROPOSALS

This Guide has been prepared to assist in the preparation and processing of a complete Technical Package for Firm Proposals

1. Technical Package Preparation

    A. Preparation instructions

        1. Memo of transmittal to Contracts

            The transmittal memo will be prepared by the Change Integrator. An example and instruction for preparation are included in Figure 1.

        2. Technical Package

            The Technical Package will be prepared and assembled by the Change Engineer and the Change Integrator. An example and instruction for preparation are included in:

            –Figure 2A Cover Page

            –Figure 2B Cover Page for Contract Language

            –Figure 2C Contract Language

            –Figure 2D Cover Page for Attachments to Contract Language

NOTE: EVERYTHING WHICH APPEARS BOLD IN THIS INSTRUCTION SHOULD BE REPEATED, WITH PROPER INSERTIONS, EXACTLY AS IT APPEARS HERE WHEN PREPARING THE FINAL TECH PKG.

THIS WILL INSURE THAT THE TECH PKGS ARE CONSISTENT.

Transmittal Memo

The Transmittal Memo transmits the Tech Pkg to Contracts and other organizations within the program. Instructions for preparation of the Transmittal Memo follow. Numbers correspond to numbers on the example which follows.

(1) The memo number will be assigned by the CM Release desk, put that memo number in the blank.

(2) Use the date that the Tech Pkg is delivered to Contracts. (Do not use the date the memo is typed.)

(3) Enter the ECP or PCP number and Title.

   EXAMPLE: "ECPXXX, Nadir (Earth) Viewing Window for Payloads"

(4) Enter Contract's letter number. Call the cognizant Contract Administrator and ask for this letter number. This letter number will apply to all enclosures to this Technical Package.

(5) Enter an "X" beside the appropriate category. Normally this category will be determined in the strategy meeting.

(6) Address to the Contract Administrator and provide other distribution required as cc.

(7) Enter the SSCN assigned to the change.

LTR NO. _____**1**_____

DATE:_____ **2**_____

SSCN_____ **7**_____

VOLUME I
TECHNICAL PACKAGE
FOR
ECP/PCP ____

To: **6**

cc:

Subject: Transmittal of Volume I, Technical Package for_____**3**_____

_____

_____

Attachment to: _____**4**_____

Attached is the Subject Technical Package.

__**5**___   Full Claim

_____   Administrative Chg

_____   No Target Adjustment

Prepared by _____   Date _____
               Chg Integrator

Reviewed by _____   Date _____
               Chg Engr

Approved by _____   Date _____
               Tech Compliance Team Lead

Approved by _____   Date _____
               Chg Mgmt Team Lead

FIGURE 1 TRANSMITTAL MEMO

INTERNATIONAL SPACE STATION ALPHA
(ISSA)

(TITLE) (4)

ECP/PCP ___(3)___

VOLUME I

TECHNICAL PACKAGE

Instructions

(1) Enter Contract's letter number. This is the letter number used by contracts to transmit the ECP/PCP to the customer. Obtain this number from the appropriate Contract Administrator. (Note: For revised Tech Pkg, obtain a new number.)

(2) Insert the total number of pages in the Technical Package including this cover page and the Table of Contents.

(3) Use ECP or PCP whichever applies and add the assigned change number.

(4) Enter title exactly as assigned to the change.

FIGURE 2A COVER PAGE

Table Of Content

ENCLOSURE I to ATTACHMENT A
SYNOPSIS OF COMPOSITE CHANGE MEMORANDUM (CCM)
FOR

ECP/PCP ___(3)___

(TITLE) (4)

FOLLOWING IS A SYNOPSIS OF THE TECHNICAL DESCRIPTION OF CHANGE
FROM CCM _____ Dated _____

Provide a brief synopsis of the Description of Change which appears in the released CCM, also provide any groundrules and/or assumptions which you feel need to be provided for a complete understanding of the change.

DRAFT CONTRACT MODIFICATION
FOR

ECP/PCP __(4)____

(TITLE) (5)

CONTRACT AFFECTED:

NAS15–10000

Instructions

This page is the cover page for the Contract language. Numbers correspond to numbers on the example above.

(1) Enter Contract's letter number. This is the letter number used by contracts to transmit the ECP/PCP to the customer. Obtain this number from the appropriate Contract Administrator. (Note: For revised Tech Pkg, obtain a new number.)

(2) Insert the change number assigned.

(3) Insert the total number of pages including this cover page.

(4) Use ECP or PCP whichever applies and add the assigned change number.

(5) Enter title exactly as assigned to the change.

FIGURE 2B COVER PAGE FOR THE CONTRACT LANGUAGE

Instructions

This is the Draft Contract Modification which accompanies the ECP/PCP and should reflect all changes to the contract. Instructions for preparation follow. Numbers correspond to numbers in the example which follows.

(1) This is the standard preamble which will appear in each change.

(2) Cost figures will be left blank and will be filled in by contracts when applicable.

(3) This heading should appear on each page of the proposed contract language section of the Tech Pkg.

(4) Enter the total number of pages in the Contract Language section of the Tech Pkg.

(5) Enter the ECP/PCP number.

(6) Enter the page number of Attachment C, include the cover page.

(7) Enter the SSCN assigned to this change.

General: Choose the sections which apply to this change and provide either the added language which is to be applied or provide FROM–TO language which will apply.

FIGURE 2C CONTRACT LANGUAGE

THIS IS A DEFINITIVE CONTRACT MODIFICATION TO CONTRACT NAS15–10000:

This Definitive Contract Modification is issued by the National Aeronautics and Space Administration (herein referred to as NASA) to Boeing Defense and Space Group (BD&SG), (herein referred to as the Contractor) to modify contract NAS15–10000 as described herein. All work performed, action taken, and cost incurred will be deemed to have been performed, taken, incurred and made under this contract modification.

The Total Amount of this Definitive Contract Modification is as follows:

    (COST)

    (FEE)

Contract NAS15–10000 is hereby modified as follows:

1.   **Revise Part I, "The Schedule" as follows:**

    A.   **In Section A "Solicitation/Contract Form" revise as follows:
        "Table of Content"**
        (Show additions or show "From – To" language for revised requirements)

    B.   **In Section B "Supplies or Services and Price/Costs" revise as follows:
        B.1 "Estimated Cost and Fee"**
        (Show additions or show "From – To" language for revised requirements)

        B.2 "Incentive Fee"
        (Show additions or show "From – To" language for revised requirements)

        B.3 "Contract Funding"
        (Show additions or show "From – To" language for revised requirements)

        B.4 "Scope of Work"
        (Show additions or show "From – To" language for revised requirements)

        B.5 "Fiscal Year Expenditure Constraints"
        (Show additions or show "From – To" language for revised requirements)

        B. 6 "Supercedure"
        (Show additions or show "From – To" language for revised requirements)

        B.7 "Fee Approach Prior to Definitization of Product Groups"
        (Show additions or show "From – To" language for revised requirements)

C. **In Section C "Description/Specification/Work Statement" revise as follows:**

C.1 "Statement of Work"

1. **Add a new paragraph as follows:**

2. **Revise paragraph ___ as follows:**

   FROM:

   TO:

D. **In Section D "Packaging and Marking" revise as follows:**
(Show additions or show "From – To" language for revised requirements)

E. **In Section E "Inspection and Acceptance" revise as follows:**

   E.1 "Material Inspection and Receiving Report"
(Show additions or show "From – To" language for revised requirements)

   E.2 "Manned Space Flight Item
(Show additions or show "From – To" language for revised requirements)

   E.3 "Inspection and Acceptance"
(Show additions or show "From – To" language for revised requirements)

F. **In Section F "Deliveries and Performance" revise as follows:**

   F.1 "Completion of Work"
(Show additions or show "From – To" language for revised requirements)

   F.2 "Shipment by Government Bills of Lading"
(Show additions or show "From – To" language for revised requirements)

   F.3 "Flight Item"
(Show additions or show "From – To" language for revised requirements)

   F.4 "Deliverables"
(Show additions or show "From – To" language for revised requirements)

G. **In Section G "Contract Administration Data" revise as follows:**

   G.1 "Submission of Voucher for Payment"
(Show additions or show "From – To" language for revised requirements)

   G.2 "Designation of New Technology Representative and Patent Representative"
(Show additions or show "From – To" language for revised requirements)

   G.3 "Technical Direction"
(Show additions or show "From – To" language for revised requirements)

G.4 "Travel Outside of the United States"
(Show additions or show "From – To" language for revised requirements)

G.5 "Financial Reporting of Government–Owned/Contractor–held Property"
(Show additions or show "From – To" language for revised requirements)

G.6 "List of Government–Furnished Property"
(Show additions or show "From – To" language for revised requirements)

G.7 "Use of Government Production and Research Property on a No–Charge Basis"
(Show additions or show "From – To" language for revised requirements)

G.9 "Installation–Provided Government Property"
(Show additions or show "From – To" language for revised requirements)

G.10 "Request for Waiver or Deviation"
(Show additions or show "From – To" language for revised requirements)

G.11 "Change in Government–Provided Services"
(Show additions or show "From – To" language for revised requirements)

G.12 'Government–Furnished Materials"
(Show additions or show "From – To" language for revised requirements)

G.13 "List of Installation Property and Services"
(Show additions or show "From – To" language for revised requirements)

G.14 "Price Adjustment for "Make–Or–Buy" Changes"
(Show additions or show "From – To" language for revised requirements)

H.   In Section H "Special Contract Requirements" revise as follows:

H.1 "Special Provisions Regarding Lockheed Subcontract Assigned to Boeing"
(Show additions or show "From – To" language for revised requirements)

H.2 "Provisioning Procedures"
(Show additions or show "From – To" language for revised requirements)

H.3 "Representations, Certifications, and Other Statements of Offerors"
(Show additions or show "From – To" language for revised requirements)

H.4 "Limitation of Applicable Documents"
(Show additions or show "From – To" language for revised requirements)

H.5 "Export of Technical Data, Computer Software, or Hardware in the Conduct of Space Station Related Activities"
(Show additions or show "From – To" language for revised requirements)

H.6 "Household Goods Shipment"
(Show additions or show "From – To" language for revised requirements)

H.7 "Technical Information Releases and Publications"
(Show additions or show "From – To" language for revised requirements)

H.8 "Manned Space Flight Motivation Awareness Program"
(Show additions or show "From – To" language for revised requirements)

H.9 "Pricing of Common Items to International Partners"
(Show additions or show "From – To" language for revised requirements)

H.10 "Government Approval/Concurrence"
(Show additions or show "From – To" language for revised requirements)

H.11 "Annual Funding Profile"
(Show additions or show "From – To" language for revised requirements)

H.12 "Indemnification"
(Show additions or show "From – To" language for revised requirements)

H.13 "Special Termination Costs"
(Show additions or show "From – To" language for revised requirements)

H.14 "Property/Data To Be Furnished By International Partners"
(Show additions or show "From – To" language for revised requirements)

H.15 "NASA Assistance by Civil Servants"
(Show additions or show "From – To" language for revised requirements)

H.16 "Identification and Approval For Use of Restricted Computer and Software and/or Commercial Computer Software"
(Show additions or show "From – To" language for revised requirements)

H.17 "Contract Billing"
(Show additions or show "From – To" language for revised requirements)

H.18 "Key Product Groups"
(Show additions or show "From – To" language for revised requirements)

H.19 "Order of Precedence"
(Show additions or show "From – To" language for revised requirements)

H.20 "Use of the ISSA Lab (On–Orbit)"
(Show additions or show "From – To" language for revised requirements)

H.21 "Special Provision for Contract Changes"
(Show additions or show "From – To" language for revised requirements)

H.22 "Space Station Freedom Hardware and Software Usage"
(Show additions or show "From – To" language for revised requirements)

H.23 "Special Provision for Government Furnished Data"
(Show additions or show "From – To" language for revised requirements)

H.24 "Sustaining Engineering"
(Show additions or show "From – To" language for revised requirements)

H.25 "Facilities"
(Show additions or show "From – To" language for revised requirements)

H.26 "Contemplated Specification Changes"
(Show additions or show "From – To" language for revised requirements)

H.27 "Specification Changes Resulting from Previously Authorized Contract Changes"
(Show additions or show "From – To" language for revised requirements)

H.28 "Specification Evaluation Provision"
(Show additions or show "From – To" language for revised requirements)

H.29 "Special Provision Regarding International Partners/Participants' Specifications"
(Show additions or show "From – To" language for revised requirements)

H.30 "Advance Agreement Regarding Direct and Indirect Rates used as a Basis for Negotiation Settlement and Allocation of Prime Contractor Indirect Costs to Certain Subcontract Labor"
(Show additions or show "From – To" language for revised requirements)

H.31 "Re–Opener Clause for Lower Tier–Subcontract Negotiations"
(Show additions or show "From – To" language for revised requirements)

H.32 "Agreement Regarding PE&I "Class II" Changes"
(Show additions or show "From – To" language for revised requirements)

H.33 "Prime/Subcontractor Relationship"
(Show additions or show "From – To" language for revised requirements)

H.33 "Cross–Waiver of Liability"
(Show additions or show "From – To" language for revised requirements)

2. **Revise Part II, "Contract Clauses" as follows:**

    A. **In Section I "Contract Clauses" revise as follows:**

        I.1 "Listing of Clauses Incorporated by Reference"
        (Show additions or show "From – To" language for revised requirements)

        I.2 "Clauses Incorporated by Reference"
        (Show additions or show "From – To" language for revised requirements)

I.3 "Requirement for Certificate of Procurement Integrity Modification"
(Show additions or show "From – To" language for revised requirements)

I.4 "Approval of Contract"
(Show additions or show "From – To" language for revised requirements)

I.5 "Security Requirements for Unclassified Automated Information Resources"
(Show additions or show "From – To" language for revised requirements)

I.6 "Payment for Overtime Premiums"
(Show additions or show "From – To" language for revised requirements)

I.7 "Hazardous Material Identification and Material Safety Data"
(Show additions or show "From – To" language for revised requirements)

I.8 "Duty–Free Entry Supplies"
(Show additions or show "From – To" language for revised requirements)

I.9 "Rights in Data General"
(Show additions or show "From – To" language for revised requirements)

I.10 "Rights to Proposal Data (Technical)"
(Show additions or show "From – To" language for revised requirements)

I.11 "Electronic Funds Transfer Payment Methods"
(Show additions or show "From – To" language for revised requirements)

I.12 "Changes–Cost Reimbursement(Deviation)"
(Show additions or show "From – To" language for revised requirements)

I.13 "Notification of Changes"
(Show additions or show "From – To" language for revised requirements)

I.14 "Space Hardware Reporting"
(Show additions or show "From – To" language for revised requirements)

3. **Revise Part III, "List of Documents, Exhibits, and Other Attachments" as follows:**

A. **In Section J, "List of Attachments" revise as follows:**

J.1 "Fee Plan"
(Show additions or show "From – To" language for revised requirements)

J.2 "List of Government Furnished Property"
(Show additions or show "From – To" language for revised requirements)

J.3 "On–Site Provisions for NASA Centers"
(Show additions or show "From – To" language for revised requirements)

J.4 "Data requirements"
(Show additions or show "From – To" language for revised requirements)

J.5 "Deliverable Items List"
(Show additions or show "From – To" language for revised requirements)

J.6 "Applicable Documents List"
(Show additions or show "From – To" language for revised requirements)

J.7 "Applicable Documents List"
(Show additions or show "From – To" language for revised requirements)

J.8 "Small Business and Small Disadvantaged Business Subcontracting Plan"
(Show additions or show "From – To" language for revised requirements)

J.9 "Provisioned Items"
(Show additions or show "From – To" language for revised requirements)

J.10 "Memorandum of Understanding"
(Show additions or show "From – To" language for revised requirements)

J.11 "Common Hardware"
(Show additions or show "From – To" language for revised requirements)

J.12 "Property/Data to Provided by International Partners"
(Show additions or show "From – To" language for revised requirements)

J.13 "Hazardous Material"
(Show additions or show "From – To" language for revised requirements)

J.14 "SSF Equipment List"
(Show additions or show "From – To" language for revised requirements)

ECP/PCP (4)

CONTRACT MODIFICATION

ATTACHMENTS

CONTRACT AFFECTED:

NAS15–10000

Includes the following: (5)

1) Data Requirement Descriptions (DRDs)

2) Other Contract Attachments required for this modification.

Instructions

This page is the cover page for the Attachments to the Contract language. Numbers correspond to numbers on the example.

(1) Enter Contract's letter number. This is the letter number used by contracts to transmit the ECP/PCP to the customer. Obtain this number from the appropriate Contract Administrator. (Note: For revised Tech Pkg, obtain a new number.)

(2) Insert the change number assigned.

(3) Insert the total number of pages including this cover page.

(4) Use ECP or PCP whichever applies and add the assigned change number.

(5) List all attachments to this proposal.

FIGURE 2C COVER PAGE FOR THE ATTACHMENTS TO THE CONTRACT LANGUAGE

APPENDIX D DOCUMENTATION MANAGEMENT

TABLE OF CONTENTS

ATTACHMENTS

D.1 CONTROL AND MAINTENANCE

D.1.1 SPECIFICATIONS

All baselined Type A and B specifications will be controlled and maintained through the configuration control requirements set out in SSP 41171, Preparation of Program–Unique Specifications. Refer to paragraph D.3 for detailed instructions.

D.1.2 REQUIREMENTS DOCUMENTS MAINTENANCE

Document changes/revisions require the same level of authorization as the original released/baselined document. Maintenance of requirements documents are approved by the Program Manager, or other delegated authority. Maintenance is done by Document Revision, or DCNs. (See Attachment A.) Document changes/revisions for documents under baseline control, will be prepared by the Book Manager of each document in accordance with the procedures outlined in Appendix C, Integrated Change Process, of this document.

D.1.2.1 DOCUMENT CHANGE NOTICES

Baselined documents will be changed by approved DCNs. DCNs are used in lieu of a complete revision to a document in order to avoid excessive administrative costs. DCNs will be identified by numbers which will be obtained from ERU, and which comply with all of the following:

a. One DCN number will be assigned to each DCN and will be the common identifier for all pages or sheets of the DCN, along with the basic document number.

b. One DCN will be prepared to cover all changes proposed to a single approved document by an ECP/CCM.

c. DCN number will be assigned in an unbroken numerical progression for each document beginning with DCN 001. For computer purposes, the numerals may be preceded by zeros dependent upon the number of character positions desired.

d. Once the DCN number has been assigned to a Document Change and submitted for approval, it will not be changed or reassigned to another DCN within the same document even though the original DCN is canceled or subsequently disapproved.

e. DCN numerical progression will not restart with one when a revision to a document occurs but will continue in progression.

f. If it is necessary to revise and resubmit a DCN, the same basic DCN number is retained on the new DCN and a revision suffix will be issued. A new date entry will also be included.

g. DCN revision suffixes will be assigned in sequential order (R1, R2, R3, etc.) in accordance with SSP 41171.

D.1.2.2 DOCUMENT CHANGE NOTICE PREPARATION

DCNs are prepared and released in replacement page format such that the individual pages will be replaced without compromising document integrity. Replacement pages will include change

bars in the right margin corresponding to changed text. Change notices will be prepared using the DCN form provided in Attachment A or a cover sheet which specifies the following information:

a. Change Notice Number – consecutive ascending number sequence beginning with 1 (or 01, 001, etc.) for each document.

b. Date – Date of the DCN.

c. Document No./Rev. – Number and revision of the document being changed.

d. Related Change No./Space Station Control No. (SSCN) – Number of the change (ECP, PCP, TCP, etc.) which resulted in the Change Notice.

e. Directive Number – Identification number of the Directive which approved the change for implementation.

f. Pages Changed – Listing of the pages affected by the Change Notice.

g. Order of Incorporation – Instruction to the document users as to the correct order of incorporation of multiple Change Notices pending issuance of a complete revision.

DCNs will only be used when a change affects less than 20 percent of the total pages of the Document and the cumulative effect of all change notices since the last revision is less than 40 percent. If either of the above conditions is not met, the Document Originator will prepare a revision. DCNs will be released through ERU as specified in Appendix E of this document.

D.1.3 DOCUMENT REVISIONS

Document revisions will be a complete reissuance of the document. Revisions will incorporate all previously approved and released Change Notices. Document revisions will be indicated by a revision letter in conjunction with the document number on each page of the document. Released revisions will not use change bars to indicate changed text. Document revisions will also be released through ERU as specified in Appendix E of this document.

D.2 CONFIGURATION ITEM/COMPUTER SOFTWARE CONFIGURATION ITEM

The CI is a designation applied to an aggregation of hardware or software, or any of its discrete portions, which satisfies an end use function. A CI may be designated by NASA as deliverable and formally accepted on a DD Form 250 or equivalent. CIs may be line items in the contract. Software CIs are normally referred to as CSCIs. For the ISSA, flight elements should be designated as CIs, but flight elements may also include several CIs. ISSA systems will contain hardware to be installed in flight elements, so normally, systems hardware will be part of an element CI. System hardware elements which are deliverable items should be separate CIs. A CI delivered to the element contractor for installation into the flight element CI is considered to be GFE.

D.2.1 CONFIGURATION ITEM/COMPUTER SOFTWARE CONFIGURATION ITEM IDENTIFICATION

CI/CSCIs will be identified by a permanent alphanumeric designator not exceeding seven digits assigned to identify all units comprising one CI/CSCI family (type–model–series). The CI/CSCI identification will be assigned by the design activity or contractor at the time the CI/CSCI specification is released.

D.2.1.1 TYPE–MODEL–SERIES

This designation constitutes a block of one or more CI/CSCI units to which the following applies:

a. All units will be designed to and controlled by one CI/CSCI development/software requirements specification.

b. All units will be identified and documented by one top drawing and a subordinate structure of installation, subassembly, and detail drawings.

c. Within this basic drawing structure, configuration differences in production between units will be identified and documented by adding and/or limiting the design application of parts and assemblies comprising the affected units.

d. The type–model–series will be the foundation for provisioning end item spares (by the contractor or the procuring agency) and for preparing operating and maintenance manuals for the CI/CSCI type–model–series.

D.2.1.2 CONFIGURATION ITEM/COMPUTER SOFTWARE CONFIGURATION ITEM DESIGNATION ELEMENTS

The CI/CSCI designation will consist of a basic number for the type–model–series followed by an alpha code for the series where required.

The basic number will be comprised of 6 characters and may be a combination of letters, Arabic numbers, and dashes (–). It will precede, but not be separated from, the "series" code. Once assigned to a CI/CSCI, this portion of the CI/CSCI number shall not thereafter be assigned to another CI/CSCI type and model.

The last character of the CI/CSCI number shall be the letter "A." Once assigned, this letter will be the permanent series designation for all CI/CSCIs comprising the type–model–series including follow–on procurement within that series.

A new series designation (B, C, etc.) for the same CI/CSCI basic number will be assigned only when all of the following apply:

a. The new series requires a new CI/CSCI specification or specification addendum.

b. All units in the new series must be identified by a new part number on the top drawing. The existing subordinate structure of installation, subassembly, and detail drawings may be made

    applicable as required to the new series by a common release which shows design application for both series.

c. A new basis for acceptance, provisioning operations, and maintenance will be established.

D.3 SPECIFICATIONS

D.3.1 SPECIFICATION IDENTIFICATION NUMBERS

Specification identification numbers will be assigned to identify all specifications required to control design of systems or equipment to be formally accepted by the procuring agency.

Specification identification numbers will not exceed a total of 15 characters. This identification will consist of the basic document and a revision suffix code. The basic number portion of the specification identification number may include combinations of Arabic numerals, letters, and dashes (–). It will precede, but not be separated from, the revision suffix code. Once assigned to an approved specification, it will not thereafter be changed or reassigned to another specification. New document identification numbers will be assigned for addendum specifications. As specifications are released by the Prime and later put under NASA baseline change control, the original specification number will not be changed.

D.3.2 SPECIFICATION PREPARATION

Specifications will be prepared in accordance with the requirements of the design activity or contractor DRs and SSP 41171, Preparation of Program–Unique Specifications.

D.3.2.1 FORM AND FORMAT

Specification form and format will be in accordance with SSP 41171, Preparation of Program–Unique Specifications.

D.3.2.2 AUTHENTICATION PAGE

The minimum data elements that will be shown on the authentication page for CI/CSCI specifications are as follows:

a. Specification number and revision letter

b. Date released

c. Type of specification

d. Title and nomenclature for the specification

e. Approved program or project nomenclature identity

f.   CI/CSCI number

g.   Design activity or contractor's Commercial and Government Entity (CAGE) code

h.   Preparing activity approval signature and date

i.   Approving activity signature and date

j.   Contract number

k.   Program specifications that apply to more than one major design activity/contractor will be approved by signature by each affected design activity (i.e., Prime, International Partners, etc.).

D.3.3 SPECIFICATION MAINTENANCE

CI/CSCI specifications changes/revisions require the same level of authorization as the original released/baselined document. Maintenance of specifications is approved by the Program Manager, or other delegated authority. Maintenance is done by CI/CSCI specification revision or SCN. (See Attachment C). CI/CSCI specification changes/revisions for specifications under baseline control, will be prepared by the book Manager of each CI/CSCI specification in accordance with the procedures outlined in Appendix C, Integrated Change Process, of the document.

D.3.3.1 SPECIFICATION CHANGE NOTICES

Baselined specifications will be changed by approved SCNs. SCNs are used in lieu of a complete revision to a specification in order to avoid excessive administrative costs. SCNs will be identified by numbers which will be obtained from ERU, and which comply with all of the following:

a.   One SCN number will be assigned to each SCN and will be the common identifier for all pages or sheets of the SCN, along with the basic specification number.

b.   One SCN will be prepared to cover all changes proposed to a single approved specification by an ECP/CCM.

c.   SCN numbers will be assigned in an unbroken numerical progression for each specification beginning with one. For computer purposes, the numerals may be preceded by zeros dependent upon the number of character positions desired.

d.   Once the SCN number has been assigned to a Specification Change and submitted for approval, it will not be changed or reassigned to another SCN within the same specification even though the original SCN is canceled or subsequently disapproved.

e.   SCN numerical progression will not restart with one when a revision to a specification occurs but will continue in progression.

f.   If it is necessary to revise and resubmit a SCN, the same basic SCN number is retained on the new SCN and a revision suffix will be issued. A new date entry will also be included.

g. SCN revision suffixes will be assigned in sequential order (R1, R2, R3, etc.) in accordance with SSP 41171.

D.3.3.2 SPECIFICATION CHANGE NOTICES PREPARATION

SCNs are prepared and released in replacement page format such that the individual pages will be replaced without compromising CI/CSCI specification integrity. Replacement pages will include change bars in the right margin corresponding to changed text. Change notices will be prepared using the SCN form provided in Attachment C or a cover sheet which specifies the following information:

a. Change Notice Number – consecutive ascending number sequence beginning with 1 (or 01, 001, etc.) for each CI/CSCI specification.

b. Date – Date of the SCN.

c. Specification No./Rev. – Number and revision of the specification being changed.

d. Related Change No./Space Station Control No. (SSCN) – Number of the change (ECP, PCP, TCP, etc.) which resulted in the Change Notice.

e. Directive Number – Identification number of the Directive which approved the change for implementation.

f. Pages Changed – Listing of the pages affected by the Change Notice.

g. Order of Incorporation – Instruction to the CI/CSCI specification users as to the correct order of incorporation of multiple Change Notices pending issuance of a complete revision.

SCNs will only be used when a change affects less than 20 percent of the total pages of the CI/CSCI specification and the cumulative effect of all change notices since the last revision is less than 40 percent. If either of the above conditions is not met, the CI/CSCI Specification Originator will prepare a revision. SCNs will be released through ERU as specified in Appendix E of this document.

D.3.3.3 SPECIFICATION REVISION

A specification revision, when authorized by the SSCB or other delegated IPT/AIT after baselining, will incorporate all revised pages and outstanding approved SCNs identified on the Specification Change Log. All pages of the revised specification will reflect the latest revision letter.

D.4 DRAWING AND PART NUMBERS

The term "drawings" as used herein includes drawings and associated lists. Drawing and part numbers will be assigned in accordance with DOD–STD–100, Engineering Drawing Practices by the design activity or contractor to provide a common part number for all parts and assemblies that are interchangeable in all applications.

D.4.1 DRAWING STANDARDS

Drawings are prepared in accordance with DOD–D–1000, Drawing, Engineering, and Associated Lists to the level specified in the SOW. DOD–STD–100 will apply when specifically invoked by the contract. Drawings may be prepared in accordance with the contractor's approved drafting practices which are compliant with DOD–STD–1000 and DOD–STD–100. All drawings will be identified by design activity or contractor code identification and drawing numbers.

D.4.1.1 LEGIBILITY

Drawings and reprints will be of sufficient clarity such that every line, number, letter, and character is clearly legible, readable, and in the English language. MIL–M–9868/1, Microfilm of Engineering Documents, 35MM, Preparation of Roll, will be used as a guide for legibility requirements.

D.5 PART MARKING

Part marking will be accomplished in accordance with the requirements set out in MIL–STD–130.

D.5.1 SERIALIZATION

Serial numbers will be assigned for CM purposes to do the following:

a. Identify individual units within a family of parts/assemblies
b. Establish this identity as the specific address for all contractual and management actions
c. Establish this address to be the same as the effectivity (usage) of engineering design and engineering changes which result from contractual and management actions
d. Relate the specific part number configuration of each part/assembly to its engineering effectivity so that it will be built, allocated, and changed in accordance with required design

These numbers will be assigned in an unbroken numerical progression within one CI type–model–series beginning with one. For computer and standardization purposes, the numbering may be signified by a three–position number (e.g., 001, 002, 003, etc.).

D.5.2 PART NUMBERS

Part numbers will be changed whenever the part is revised to such an extent that the new part is no longer interchangeable with the old. Part numbers will be changed from the affected part/assembly, up to and including, the level at which interchangeability is reestablished.

D.5.3 SERIAL NUMBERS

Serial numbers are assigned in accordance with DOD–100; will be sequential and nonrepeating; and are never changed or reassigned even when the part number is changed. If an item goes out of existence (i.e., scrapped), the serial number for that item will not be reused.

D.6 DESIGN ACTIVITY OR CONTRACTOR "COMPANY" SPECIFICATIONS

Material, processing, testing, and procurement from subcontractor or supplier specifications may be to the design activity or contractor format, or as specified in Specification Data Requirement Documents (SDRDs).

D.7 KENNEDY SPACE CENTER FACILITY AND EQUIPMENT REQUIREMENTS DEFINITIONS AND FACILITY AND EQUIPMENT DESIGN PLANS

Facility and Equipment Requirement Definitions (FERDs) and Facility and Equipment Design Plans (FEDPs) will be prepared in accordance with the intent of MIL–STD–490, Specification Practices for style and format. The FEDPs document the engineering, operations, support, and facility requirements at the KSC and reflect the approved design documentation which is released. The FEDPs will be updated to reflect the as–built and/or as–accepted hardware or software configuration.

ATTACHMENT A TO APPENDIX D
DOCUMENT CHANGE NOTICE
FORM AND PREPARATION INSTRUCTIONS

Instructions for the preparation of the DCN.

Use the following instructions to complete each block on the form:

1. Enter the name and address of the contractor of Government activity which is preparing the DCN.

2. Indicate by an "x" in the appropriate block if this is a proposed or approved DCN.

3. Code Indent – Enter the Code Indent (CAGE Code) of the design activity for the document identified in block 4.

4. Change Notice No. – Enter the identification number assigned to the Change Notice. This number will be assigned in accordance with paragraph D.1.2.1.

5. Contract No. – Enter the Contract Number of the activity preparing the DCN.

6. Directive Number – Enter the directive number which authorized the DCN being prepared.

7. Document No./Rev. – Enter the document number, including the revision letter, of the document being changed.

8. Document Title – Enter the complete document title that identifies the document being changed.

9. SSCN Number – Enter the SSCN assigned to the change by the Change management team.

10. Related Change No. – Enter the completed ECP/CCP number that identifies the related change.

11. Change Title – Enter the Change Title assigned to the ECP or CCP, identified in Block 10.

12. CN No. – Enter the identification number assigned to the Change Notice. This number will be assigned in accordance with paragraph D.1.2.1.

13. Pages Changed – List the pages changed by this DCN. A separate line should be used for each category of page change. Indicate by "X" in the appropriate column (Superseded or Added). Deleted pages will be listed and noted "Deleted."

14. Technical Concurrence – Enter the signature of the approving authority and date signed.

15. Date – Enter the date the DCN is/was approved.

CHANGE NOTICE

Date Prepared:

1. The Boeing Company Johnson Space Center Houston Tx 77058	2. ☐ Proposed ☐ Approved	3. Code Ident.	4. Change Notice No.
		5. Contract No.	6. Directive No.

7. Document No./Rev.	8. Document Title	9. SSCN No.

10. Related Change No.	11. Change Title

THIS NOTICE INFORMS RECIPIENTS THAT THE DOCUMENT IDENTIFIED BY THE NUMBER (AND REVISION LETTER) SHOWN IN BLOCK 7 HAS BEEN CHANGED. THE PAGES CHANGED BY THIS CN BEING THOSE FURNISHED HEREWITH AND CARRYING THE SAME DATE AS THIS CN. THE PAGES OF THE PAGE NUMBERS AND DATES LISTED BELOW IN THE SUMMARY OF CHANGED PAGES COMBINED WITH NON–LISTED PAGES OF THE ORIGINAL ISSUE OF THE REVISION SHOWN IN BLOCK 7 CONSTITUTE THE CURRENT VERSION OF THIS SPECIFICATION.

12. CN No.	13. Pages Changed (Indicate Deletions)	S*	A*	15. Date
	Order of CN Incorporation			

14. Technical Concurrence

_____   _____
                                                    Date

* "S" indicates supersedes earlier page. "A" indicates added page.

**ATTACHMENT B TO APPENDIX D
SPECIFICATION CHANGE NOTICE
FORM AND PREPARATION INSTRUCTIONS**

Instructions for the preparation of SCN.

Use the following instructions to complete each block on the form:

1. Enter the name and address of the contractor or Government activity which is preparing the SCN.

2. Indicate by an "x" in the appropriate block for a proposed SCN.

3. Code Ident. – Enter the Code Indent (CAGE Code) of the design activity for the specification identified in block 4.

4. Spec. No./Rev. – Enter the identification number, including revision letter, of the specification being changed.

5. Code Ident. – Enter the Code Ident (CAGE Code) of the activity preparing the SCN.

6. SCN No. – Enter the identification number for the SCN being submitted. Numbers will be assigned in accordance with paragraph D.3.3.3.

7. System Designation – Enter the type, model, and series for the system affected.

8. Related Change No./Title – Enter the complete ECP number that identifies the related engineering change and its Title.

9. Contract No. – Enter the complete contract number affected by the SCN.

10. Directive No./SSCN No. – Enter the SSCN or directive number assigned to the change by the Change management team.

11. Configuration Item Nomenclature – Enter the nomenclature (name and number) of the CI affected by the change.

12. Effectivity –
    (a) For hardware, enter the serial numbers of the items for which the SCN is effective.
    (b) For CSCIs, enter the revision or version of the CSCI to which the change applies.

13. SCN No. – Enter the identification number for the SCN being submitted. Numbers will be assigned in accordance with paragraph D.3.3.3.

14. Pages Changed – List the pages changed by this SCN. A separate line should be used for each category of page change. Indicate by "X" in the appropriate column (Superseded, Added). Deleted pages will be listed and noted "Deleted."

15. Date – Enter the date the SCN is/was approved.

16. Technical Concurrence – Enter the signature of the approving authority and date signed.

SPECIFICATION CHANGE NOTICE

Date Prepared:

| 1.

The Boeing Company
Johnson Space Center
Houston Tx 77058 | 2.

☐ Proposed

☐ Approved | 3. Code Ident. | 4. Spec. No./Rev. |
|---|---|---|---|
| | | 5. Code Ident. | 6. SCN No. |

7. System Designation	8. Related Change No./Title	9. Contract No.	10. Directive No./SSCN NO.

11. Configuration Item Nomenclature	12. Effectivity

THIS NOTICE INFORMS RECIPIENTS THAT THE DOCUMENT IDENTIFIED BY THE NUMBER (AND REVISION LETTER) SHOWN IN BLOCK 4 HAS BEEN CHANGED. THE PAGES CHANGED BY THIS SCN BEING THOSE FURNISHED HEREWITH AND CARRYING THE SAME DATE AS THIS SCN. THE PAGES OF THE PAGE NUMBERS AND DATES LISTED BELOW IN THE SUMMARY OF CHANGED PAGES COMBINED WITH NON–LISTED PAGES OF THE ORIGINAL ISSUE OF THE REVISION SHOWN IN BLOCK 4 CONSTITUTE THE CURRENT VERSION OF THIS SPECIFICATION.

13. SCN No.	14. Pages Changed (Indicate Deletions)	S*	A*	15. Date
	Order of SCN Incorporation			

16. Technical Concurrence

_____   _____
                                                              Date

* "S" indicates supersedes earlier page. "A" indicates added page.

(This page reserved)

APPENDIX E PROGRAM DATA MANAGEMENT

TABLE OF CONTENTS

FIGURES

TABLES

ATTACHMENTS

E.1 PROGRAM DATA MANAGEMENT

This section provides an overview of the IPT approach as applied to Data Management and its CMAIT functions at the Prime contractor.

E.2 ENGINEERING RELEASE UNIT

The ERU is a function of Data Management and is responsible for ensuring compliance with contractual and company requirements for data quality, data release, release authorization, and release status reporting. The following is a breakdown of these functions:

E.2.1 DATA QUALITY ASSURANCE (DQA)

DQA is a function of Data Management and is responsible for ensuring nontechnical compliance with contractual, company, and program requirements for specifications, documents, drawings, and associated parts lists. DQA will be accomplished in accordance with the contract requirements. A DQA representative will be assigned to the individual NASA/Prime IPTs providing support on a part–time basis. The DQA philosophy will support the common goals of the IPTs while maintaining the integrity of the DQA review and data approval process.

E.2.1.1 DOCUMENT DATA QUALITY ASSURANCE

DQA will provide format and editing guidance and, as needed, training to ensure the preparation of a quality product. The DQA representative will be responsible for coordinating any training needs associated with the formal release of the data with the data release organization.

E.2.2 PRODUCT GROUPS

DQA will, upon request from the responsible IPT/AIT, accomplish a brief review of a representative sample of PG data to ensure nontechnical compliance with the supplier's SOW.

E.2.3 ELECTRONIC CHECKS

DQA applies a series of checks on the electronic files associated with the data for release. This may encompass verification of borders and layers in the Computer–Aided Design (CAD) system, or ensuring viewing and printing rules have been applied to document files before they are stored in the electronic library.

E.3 TEAM STRUCTURE AND SUPPORT

Data Management is structured to provide functional DQA and data release support to the NASA/Prime IPTs/AITs. Emphasis is placed on providing product teams with the guidance and

knowledge necessary to build quality into their data rather than inspecting for it later. See Figures E–1, Data Release Process, E–2, Data Revision and Specification Change Notice Release Process, and Figure E–3, Drawing Release Process, for a detailed process flow for data submittal.

E.3.1 REQUIREMENTS IDENTIFICATION

Coordination is accomplished to ensure a complete and accurate understanding of contractual requirements affecting drawing preparation and release. Applicable sections of Boeing D–4900, Drafting Standards Manual (DSM) and D–30000, Engineering Operations Manual (EOM) will be reviewed on a regular basis to ensure their adherence with these requirements. Unique requirements and/or changes to existing requirements will be flowed down to the IPTs.

E.3.2 PRODUCT TEAM TRAINING

Upon formation of an IPT, a Data Management representative will be designated to coordinate with the IPT Lead or designated individual to determine if standard training material and/or specialized training is needed. A standard training package will be provided to each IPT which consists of a series of DQA/data release instructions designed to provide the data originator with (1) a summary of formatting and release requirements, (2) reference listing of commonly used resources (i.e., contractual documents, command media, drafting standards), (3) the name/phone number of the IPT DQA representative, and (4) names/phone numbers of data release personnel available to assist as needed.

When preparing documents, the IPT/AIT will be requested to submit one preliminary copy of the data to DQA for review and comments. Following completion of all document approvals, DQA will accomplish a final review. The Data Originator will then be requested to submit the document to DQA with the original signatures, the electronic files, and associated release order. DQA signatures will appear on each specification drawing and document indicating the item is authorized for release.

E.4 TEMPLATES CREATION

ERU has developed various form templates for use on the PC, MAC, and Interleaf systems as necessary to help data originators prepare documentation. The document format templates are available for electronic retrieval as needed, or may be requested from ERU. Associated release paper is also available on the Interleaf system.

IPT [1]
Receive Requirements for Data Preparation Complete DRD to Obtain Document Number

IPT
Follow SSP 50010 in the Preparation of Data Coordinate/Work Data Format With DQA Team Member

IPT
Prepare Data Review Comment DQA Review

DQA IPT Member
Forward Data Electronic and Signed Original with Release Order

Formal Release

Yes

IPT
Consolidate/ Coordinate and Incorporate Redlines Print

ERU
Verify Change Authority and Perform Release Electronically Vault into PALS Library Forward Data Original for Distribution

No [2]

IPT
Data Reviewed, Signed Electronic Verified and Original signed by DQA Team Member

PDM

PDM

NOTES:
[1]   Data identified with a number issued by ERU requires formal release. Obtain number/revision/outstanding
        ADRN letter/number from ERU.
[2]   No release order required.

FIGURE E–1 DATA RELEASE PROCESS

IPT [1]
Receive Requirements for the Data/ Specification Revision

IPT
Follow SSP 50010/SSP 41171 in the Revision of Data/Specification

IPT
Prepare Revised Data Consolidate/Coordinate Obtain Technical Approval Create PCM Distribute for Evaluation

IPT
Proposed Change Notice/ Specification Change Notice Attached to CCM DQA Team Member Review

AUTHORIZED APPROVAL
Approve Change

IPT
Prepare Approved Data Data Reviewed, Signed, Electronic Verified and Signed by DQA Team Member

DQA IPT Member
Forward Data Electronic and Signed Original with Release Order

ERU
Verify Change Authority and Perform Release Electronically Vault into PALS Library Forward Data Original for Distribution

PDM

NOTES:
[1]   Obtain number/revision letter from ERU. Request electronic version from ERU or retrieve from PALS.

FIGURE E–2 DATA REVISION AND SPECIFICATION CHANGE NOTICE RELEASE PROCESS

Original Release

VDI Originator

Create drawing
Include DQA
Intergraph Workstation

EMS Drawing
DAR

DQA

Quality Check
Input Electronic
Signature
Prepare Plot*
Create Raster*
Archieve to Vax*

Intergraph Workstation

H/C Drawing
DAR

ERU

Verify Release Authority
Release
Notify PDM
DNMS/MS Mail

H/C Drawing
DAR

Raster Image

VMDB/EDLS
Vax

EMS Drawing

Ability to Vault
Multiple Versions
Plus ADCNs
Vax

Repository

Distribution
Archive Hardcopy
Original
MS Mail

PDM

* Process to be automated

FIGURE E–3 DRAWING RELEASE PROCESS (PAGE 1 OF 2)

Drawing Revision

VDI Originator

Contact ERU

DQA

Quality Check
Input Electronic
Signature
Prepare Plot*
Create Raster*
Archieve to Vax*

Intergraph Workstation

ERU

Verify Release Authority
Release
Notify PDM

DNMS/MS Mail

H/C Drawing
DAR

ERU

Verify Release Status
Assign ADCN/Revision
Number
Copy from Repository*
Send to VDI*

PC

Copy EMS
Drawing

Update Drawing/
Create ADCN

Intergraph Workstation

EMS Drawing/
ADCN

H/C Drawing
DAR

Raster Image

EMS Drawing

Distribution
Archieve Hardcopy
Original

MS Mail

PDM

Copy EMS
Drawing

VMDB/EDLS

Vax

Ability to Vault
Multiple Versions
And ADCNs

Vax

Repository

Ability to Vault
Multiple Versions
And ADCNs

Vax

Repository

* Process to be automated

FIGURE E–3 DRAWING RELEASE PROCESS (PAGE 2 OF 2)

E.5 DATA RELEASE

Data release is accomplished in accordance with the applicable sections of D–30000, EOM and D–4900, DSM, in addition to the contract and its associated procedures. Procedures governing the processes and forms required by the product team to release its data will be provided to the IPTs as part of the training program described in paragraph E.3.2.

Data release is a function of the ERU that is responsible for configuration control and release of program data. The following is a breakdown of the functions accomplished during the release process:

E.5.1 DOCUMENT DEFINITIONS/NUMBER ASSIGNMENT

E.5.1.1 DEFINITION OF DOCUMENT CATEGORIES

E.5.1.1.1 Draft or Working Draft – A document/report that has not been previously released on the ISSA Program and is in work, out for comments, or in routing for approval.

E.5.1.1.2 Preliminary – A data submittal, Type 1 and 2, in accordance with the Data Requirements of the prime contract will be marked ”Preliminary” until the document is approved by NASA.

E.5.1.1.3 Redlined – Modified documents that are in the process of being updated from the version released through the Engineering Release System.

E.5.1.1.4 NASA Baseline – Documents that are approved through signing a directive through the SSCB and then released through the Engineering Release System. These documents are not reflected in the prime contract.

E.5.1.1.5 NASA–Boeing Baseline – Documents that are approved through signing a directive through the SSCB and then released through the Engineering Release System. These documents are reflected in the prime contract.

E.5.1.1.6 Boeing–PG Baseline – Documents that are approved by both parties and released through the Engineering Release System. These documents are reflected in the Boeing–PG Contract.

E.5.1.1.7 NASA or Boeing Controlled/Released – Documents that are approved by applicable IPT/AIT or COTR and released through the Engineering Release System. These documents may be reflected in the prime contract.

E.5.1.1.8 Bilateral Baseline – Documents that are approved by appropriate agencies.

E.5.1.1.9 Multilateral Baseline – Documents that are approved by appropriate agencies.

E.5.1.2 NUMBER ASSIGNMENTS

ERU will assign drawings, documents, specifications, and test reports with new numbers, revision letters, issue numbers, draft letters, DCNs, SCNs, and Advance Document Revision Notice (ADRN) letters.

E.5.2 RELEASE AUTHORIZATION

ERU ensures that formally committed data is authorized for release in accordance with the applicable schedule. The Release Order accompanying the data must reference a valid CCR page and line. The CCR will be used by ERU to validate that commitment. Following this validation, data release will record the status for that CCR page and line.

E.5.3 APPROVAL

Data release will ensure that all data has been approved for release in accordance with the program signature requirements as defined in SSP 50010, Documentation Requirements, Standards and Guidelines. Following coordination with a Technical Compliance representative, specific signature approval requirements delegated to other IPT members or functionals will be considered acceptable. Table E–1, Document Approval Requirements, defines the signatures required for program documents.

E.5.4 RELEASE ORDER

The Release Order Form provided in Attachment A must be completed in accordance with the instructions provided, and submitted with the data delivery. The Release Order form can be obtained from ERU, Interleaf Templates on the Interleaf Desktop, or downloaded from PALS.

TABLE E–1 DOCUMENT APPROVAL REQUIREMENTS

	ORIG.	ORIGINATOR'S SUPERVISOR	PRIME TEAM LEAD	NASA TEAM LEAD	COTR	IP**	SSCB	DQA
DR DATA:								
TYPE 1–BASELINED	X	X	X	X	X	X	X	X
TYPE 1–APPROVED	X	X	X	X	X	X		X
TYPE 1–PENDING APPROVAL	X	X	X			X		X
TYPE 2–APPROVED	X	X	X	X		X		X
TYPE 2–PENDING APPROVAL	X	X	X			X		X
TYPE 3–REVIEW	X	X	X			X		X
OTHER DATA:								
BOEING INTERNALLY								
RELEASED DATA	X	X	X			X		X
NASA INTERNALLY								
RELEASED DATA	X	X		X		X		X

**INTERNATIONAL PARTNERS'/PARTICIPANTS' SIGNATURES REQUIRED ON ALL DOCUMENTS WHICH AFFECT IPs

E.5.5 DRAWING/PARTS LIST AUTHENTICATION RECORD

The Drawing/Parts List Authenticaiton Record (DAR) provided in Attachment B must be completed in accordance with the instrucitons provided, and submitted with the data delivery. The DAR can be obtained from ERU, Interleaf Templates on the Interleaf Desktop, or downloaded from PALS.

E.5.6 DATA RECORDS

ERU accomplishes the preparation and maintenance of release records which account for data configuration and associated information. These records are automated to provide program visibility reporting.

E.5.7 STATUS REPORTING

 Data Management maintains and provides numerous data release status reports. Typical reports are outlined as follows:

a. Delinquency and look–ahead reports reflect open change commitments, sorted by responsible managers.
b. Drawing Release Status Report reflects the current configuration, authorizing change, title, and other associated information for drawing releases. These reports are published monthly. Real–time drawing status will be available for online viewing or printing from the Drawing Release Report available in PALS.
c. Document Release Status Report reflects the current configuration, document title, and other associated information for document releases. These reports are published bi–monthly and are available in both hard copy and electronically.

E.5.8 ELECTRONIC VAULTING

Electronic vaulting is accomplished by ERU. It is the function of electronically storing (archiving) the electronic files, making up a bookform drawing or document, into the PALS, which is an electronic library. Once the files are electronically stored, they are available to PDM through PALS for electronic submittal to the customer, and for read/copy only access to the user community (engineering, test, operations, etc.). All data released through the ERU will be electronically vaulted, in accordance with the contractual requirements for delivering all data in a manner electronically compatible with the ISSA program electronic delivery requirements, unless so noted in the DRs. Deliverable data generated by means other than CAD is electronically vaulted in an electronic library in accordance with contractual requirements.

E.5.8.1 PROGRAM AUTOMATED LIBRARY SYSTEM

PALS is an electronic dataset control system used to store, deliver, update, view, and retrieve documents. The ERU is responsible for the electronic storage of data into PALS. PDM is responsible for the electronic transfer (delivery) of DRs to the program office.

E.5.8.1.1 PROGRAM AUTOMATED LIBRARY SYSTEM ISSA PROGRAM OFFICE LIBRARY

The PALS ISSA Program Office Library is controlled and maintained by the CM organization. All approved and baselined documentation can be viewed, printed and downloaded from this library. Table E–2 is an archetypal layout of the ISSA Program Office Library.

E.5.8.2 COMPUTER–AIDED DESIGN DRAWING RELEASE

TBD

E.5.9 DATA DISTRIBUTION

Data distribution is accomplished by the JSC Institutional Library Services following approval of the data. The contractual data requirements establishes distribution for deliverable documentation. The release order will identify distribution for documentation which is not a deliverable.

Users are encouraged to accomplish their own online viewing and, as required, printing of the drawings or documents they need. Instructions are available from ERU and JSC Information Systems personnel.

E.5.10 DATA REQUEST PROCESS/CONTROL

The Data Request Process/Control flow, as shown in Figure E–4, is used to request SSF and ISSA data. All personnel requesting data, outside of established ISSA program distributions, will utilize this process, which has been defined and implemented by the CMAIT Data Management Team and NASA Information Management, Technical Library System.

E.5.10.1 The Requestor will identify data needed and send a data request to the NASA ISSA Technical Library.

E.5.10.2 Upon receipt of a request, the Technical Librarians will determine if the data is available in the Technical Library and furnish the data to the requestor. If the data is not available in the Technical Library, the Librarian will forward SSF data requests to applicable NASA Field Center; and/or will forward ISSA data requests to ISSA Prime Data Management.

E.5.10.3 Upon receipt of a request, a NASA Field Center will reproduce and transmit requested data to the NASA ISSA Technical Library.

E.5.10.4 Upon receipt of a request from the NASA ISSA Technical Library, Prime Data Management will obtain data from applicable subcontractors and send the data to the NASA Technical Library.

E.5.10.5 Upon receipt of data from a NASA Field Center and/or Prime Data Management, the ISSA NASA Technical Libraries will forward the data to the requestor.

E.5.11 DISPOSITIONING DATA REQUIREMENTS (DR'S) SUBMITTALS

As referenced in SSP 50010–01, Documentation Standards and Guidelines, all documents submitted to NASA contain a concurrence signature page which is signed by the NASA and Boeing team leads. Type 2 documents require the NASA and Boeing team leads' signatures for release and approval. Type 1 documents require the NASA and Boeing team leads' signatures and the NASA COTR signature for release and approval.

When documents are submitted without the appropriate NASA signatures, approval will be obtained using a Technical Direction (TD) letter (Figure E–5). The TD will include the following:

a. DR Number

b. Document Number

c. Document Title

d. Data Disposition

e. Resubmittal Date (if required)

f. NASA Team of Primary Responsibility (TPR)

g. Boeing TPR

Data submittals will normally be submitted and dispositioned separately. However, more than one data item may be listed in a TD.

TABLE E–2 ISSA PROGRAM OFFICE LIBRARY STRUCTURE

Collection	Title	Contents
ISSFORMS	ISS Configuration Management Office Forms	All Configuration Management forms (i.e., change directive, team change proposal).
ISSWORK	ISS Work in Progress	Working drafts to be passed between International Partners, NASA Participants and Product Groups.
ISS_684	ISS Prime Release	All approved documentation released with a 684 prefix.
ISS_BCD	ISS Baseline Configuration Document Figures	
ISS_CCM	ISS Consolidated Change Memos	Program Consolidated Change Memos
ISS_CD	ISS Change Directives	Program Change Directives
ISS_ICD	ISS Program Baselined ICDs	Program Baseline Interface Control Documents
ISS_IDR1	ISS	
ISS_PCM	ISS Preliminary Change Memos	Program Preliminary Change Memos
ISS_RCPT	ISS Configuration Management Receipt Desk	Information/documentation to be passed between program Receipt Desks.
ISS_RFP	ISS Request for Proposal	Documentation submitted for the April 94 Request for Proposal. All the documents contained in this collection are drafts.
ISS_RFP1	ISS Request for Proposal (August 15, 1995)	Documentation submitted for the August 15, 94 Request for Proposal. All the documents contained in this collection are drafts.
ISS_RPT	ISS CM Reports	
ISS_SDR	ISS System Design Review	Documentation submitted for the System Design Review. All the documents contained in this collection are drafts.
ISS_SSP	ISS Program Release	All approved and baselined documentation released with an SSP prefix.

Data Request Process/Control

```
┌─────────────┐
│  Requestor  │
│  ID's Data  │
└─────────────┘
       │
       ▼
┌─────────────────┐
│ Requestor Sends │      SSF Data –
│ Data Request to │      not in Tech.     ┌──────────────┐    ┌──────────────┐    ┌──────────────┐
│ NASA IS Library │      Library          │ Forwards Req │──▶ │ NASA Field   │──▶ │ NASA Field   │
└─────────────────┘                       │ to NASA Field│    │ Center Obtains│   │ Center Forwards│
       │                                  │ Center       │    │ Data         │    │ Data to Library│
       ▼                                  └──────────────┘    └──────────────┘    └──────────────┘
┌──────────────────┐
│ NASA IS Library  │
│ Reviews Request  │     ISSA Data –      ┌──────────────┐    ┌──────────────┐    ┌──────────────┐
│ fills request if │     not in Tech.     │ Forwards Req │──▶ │ ISSA DM      │──▶ │ ISSA DM      │
│ Data is available│     Library          │ to ISSA DM   │    │ Obtains Data │    │ Furnishes Data│
│ in Tech. Library │                      └──────────────┘    └──────────────┘    │ to Library   │
└──────────────────┘                                                              └──────────────┘
       │
       ▼
┌──────────────┐           ┌──────────────┐
│ Requestor    │ ◀──────── │ NASA Library │
│ Receives Data│           │ Furnishes Data│
└──────────────┘           │ to Requestor │
                           └──────────────┘
```
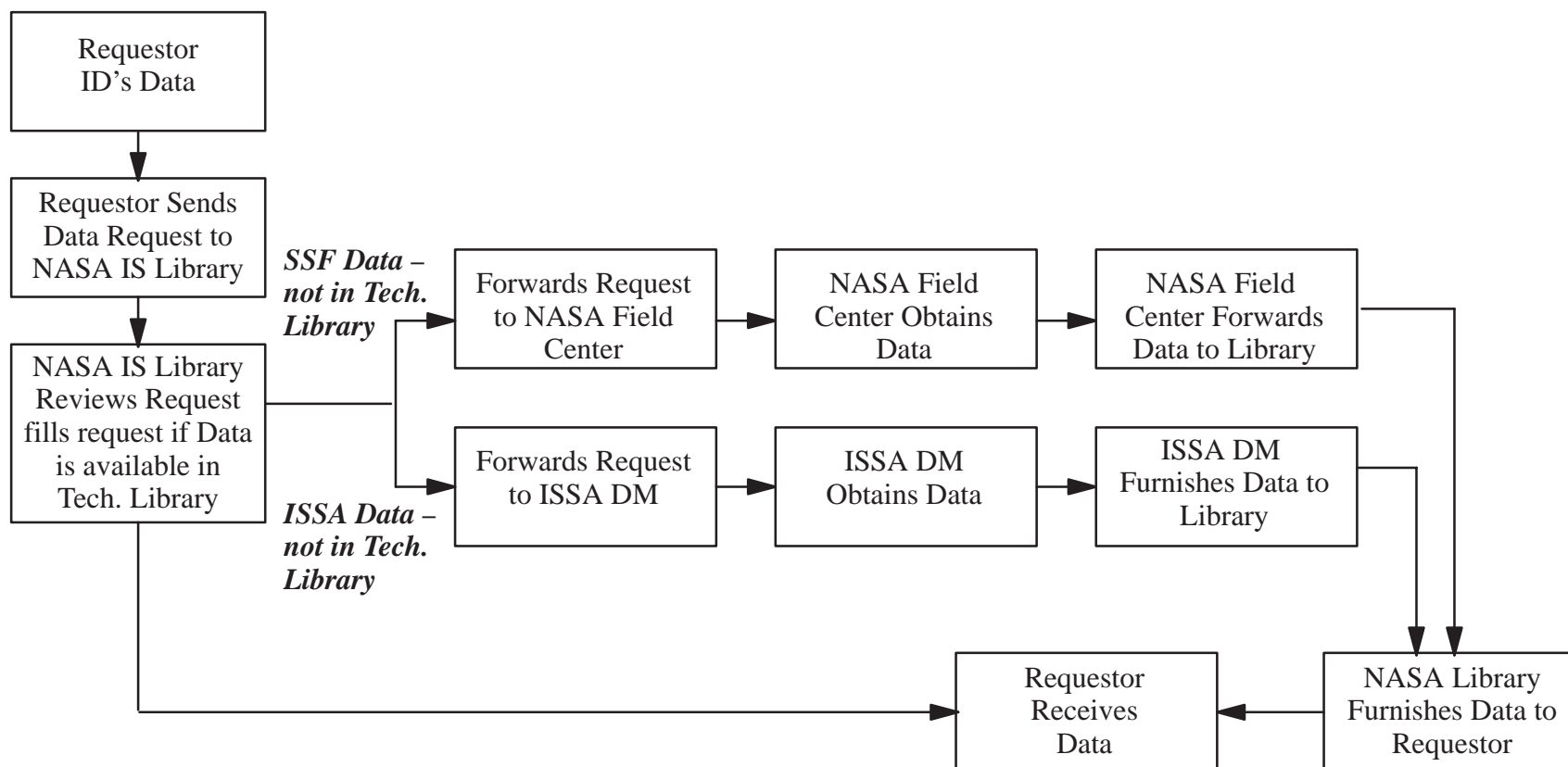
FIGURE E–4 DATA REQUST PROCESS/CONTROL

Boeing Defense and Space Group
Missiles and Space Division
Attn.: HS40/Michael Clynch
P.O. Box 58747
Houston, TX 77058

Subject: Contract NAS15–10000, Approval of Data Requirement (DR)
            Technical Direction

The following documents have been reviewed. Specific disposition of the documents is listed as follows:

Approved as submitted:

        DR Number   Document Number   Document Title

Approved with Modifications:

        DR Number   Document Number   Document Title

See enclosed list of required modifications.

Disapproved:

        DR Number   Document Number   Document Title

The above list of disapproved documents must be reworked and resubmitted to NASA within 45 days or by a specific date if urgent need requires acceleration of resubmittal. See enclosed list for disapproval comments.

This Technical Direction is of particular interest to Insert Name of Boeing Lead Person on the Team of Primary Responsibility of your organization. Any questions regarding this TD can be directed to Insert Name of NASA Lead Person on the Team of Primary Responsibility.

Contracting Officer's Technical Representative
Space Station Program Office

FIGURE E–5 TECHNICAL DIRECTION LETTER

E.6 DOCUMENT PREPARATION AND PROCESSING

E.6.1 PREPARATION AND SUBMITTAL OF DOCUMENTATION TO ENGINEERING RELEASE UNIT

The following guidelines are given to assist the user in preparing documentation to be submitted to ERU:

a. The document number, draft, and issue or revision letter/number must be obtained from ERU before preparation.

b. The document should be prepared in accordance with SSP 50010–01, Documentation Requirements, Standards and Guidelines.

c. Appendix C of SSP 50010–02 contains documentation guidelines which, if followed, will help the creator obtain a quality product. Appendix D of SSP 50010–02 contains Interleaf guidelines and will also be helpful.

d. All documents should be in Interleaf ASCII or a postscript file.

e. ISSA templates are available by accessing your system cabinet for use in preparing documents

f. Document catalogs are available and should be used when creating a document.

g. The spell check program should be invoked to ensure the document has no spelling errors.

h. Recommended font types and sizes are: Text = Times 12 point; Graphics = Helvetica 12 point up to 36 point.

i. It is recommended that page numbers be achieved through the auto numbering application. Use the properties menu inside each file and place the page number to start each electronic file in the blank next to the "inherit" field. Also, auto numbering should be locked once the document is in the correct number format (refer to SSP 50010–02).

j. A final hardcopy should be printed after all conversions and verified to ensure that the electronic copy produces an accurate version of the document being processed for approval.

k. A hardcopy along with the electronic version must be submitted to DQA for approval and the electronic version forwarded to ERU.

l. A printed list of signatures must accompany the document so the electronic signatures will be accurately entered.

m. Originators should ensure that the proper release paper accompanies the document to DQA. The release paper forms are available from ERU.

n. DQA works within the team to build in the compliance with the applicable standards and contractual/program requirements. The review consists of both hardcopy and the electronic version of the document.

o. Engineering Release will accomplish formal release of the document, and upon completion will electronically vault (store) it into PALS. Originals are then forwarded to the PDM organization for delivery.

E.6.2 ELECTRONIC SUBMITTAL

  All program data submitted to Data Management for Release must be in electronic format (if this is not possible please make advanced arrangements with a Data Management representative) When your data is in Interleaf format, the steps in Figure E–6, PALS Checklist should be used to ensure a quality document. Documents can be created in PC Word and MAC Word as long as the requirements of SSP 50010 are met. Templates are available from the ERU and Data Quality which will aid the data originator in the development process.

Documents created from PC and MAC submitted to the ERU are printed to a postscript file and converted to a Printerleaf format to be viewable in PALS. The program used to obtain a Printerleaf file is called Worldview. The Worldview product has been tested and listed below is the results of SSIS personnel.

I. The following applications which are a part of the standard Space Station workstation loads were successfully "Pressed" through Worldview by SSIS personnel:

Windows 3.1 applications (utilizing the Windows Postscript driver):

- Microsoft Word v. for Windows 2.0c
- Microsoft Excel version 4.0

Apple Macintosh Applications (utilizing LaserWriter driver v.7.1.2):

- Microsoft Word version 5.1a
- Microsoft PowerPoint version 3.0
- Microsoft Excel version 4.0
- MacDraw Pro

Mainframe Applications:

- Artemis 1.2

II. The following applications Postscript output has been qualified for use with Worldview Press by Interleaf:

Windows 3.1 applications (utilizing the Windows Postscript driver):

- Ami Professional v. 3.0
- Ventura Publisher for Windows 4.0
- Ventura Publisher for Windows 3.0
- WordPerfect for Windows 5.1
- WordPerfect for Windows 5.2
- Microsoft Word for Windows 1.0
- Microsoft Word for Windows 2.0
- FrameMaker 4.0
- Aldus PageMaker 4.0

Apple Macintosh Applications:

- AutoCAD v. 11
- Quark Xpress v. 3.0 (using LaserWriter driver v.7.0)
- Aldus Pagermaker v. 4.2 (using LaserWriter driver v.7.0)
- Ventura Publisher v. 3.2 (using LaserWriter driver v.7.0)
- Microsoft Word v. 5.0 (using LaserWriter v.7.0)
- WordPerfect v. 2.1 (using LaserWriter driver v.7.1.2)

DOS Applications:

- AutoCAD v. 10
- Word v. 5.5
- WordPerfect 5.1

UNIX Applications:

- Framemaker 3.0

Interleaf – PALS Upload Checklist

BOOK PROPERTIES

____ Book Line up*

____ Book Sync (ALL documents)*

____ Save in ASCII*

____ 11x17 docs/books at the end of the book

____ No folders, drawers, or cabinets inside a book

____ No extra icons in book (e.g., backup_history)

____ Binders contain catalogs only

EACH DOCUMENT

____ Misc – Purge – <all>

____ View x1

____ Document Properties save format set to ASCII

____ Link autoreferences in a document (first lined up and synched)*

Printer properties each document:

____ Header Page – No

____ Default Printer – nearest ps

Page Property sheet each document:
Basic

____ Orientation – Portrait or Landscape

____ Page Size – 8.50 x 11 inches or 11 x 17 inches

Custom

____ Font system – ps

____ Freeze Autonumber – Yes (only if Rev Mgmt* is *ON*)

____ Freeze Page Numbers – Off (only if Rev Mgmt* is *ON*)

____ Vertical Justification – keep default, not required to change

*indicates instructions available

FIGURE E–6 PROGRAM AUTOMATED LIBRARY SYSTEM CHECKLIST

ATTACHMENT A TO APPENDIX E
RELEASE ORDER FORM AND PREPARATION INSTRUCTIONS

Instructions for the preparation of the Release Order.

Use the following instructions to complete each block on the form:

1. Document or Test Report Number – Enter the identification number of the data being released.

2. Unclassified Title – Enter the complete title of the data being released.

3. Contract Number – Enter NAS15–10000.

4. Contract Article No. – Enter the Data Requirements number for this data.

5. Contract Item No. – Enter the contract item number for this data.

6. Contract Requirements Yes/No – Mark Yes if this data is a DR and No if this data is not a DR.

7. Data Classified Yes/No – Mark Yes if this data is classified and No if this data is not.

8. Type of Release – Mark ORIG if this data is an original release and REV if this data is a revised release.

9. Model – Enter ISSA.

10. Issue to the following /ORG No/Mail Stop/Qty/Reserved Data Transmittal Notice (DTN) No or Tel Ext. – Enter all Boeing distribution and the NASA Team Co–Lead, their organization number, their mailstop, the quantity of copies needed, and their telephone extension number.

11. Release Authorized By – Signature of responsible Team Manager.

12. Orgn No – Enter Organization number of responsible team member.

13. Mail Stop – Enter mail stop of responsible team member.

14. Tel Ext. – Enter telephone number of responsible team member.

15. Date – Enter current date.

16. Remark – Enter the release authorization and any additional information determined to be necessary.

RELEASE ORDER

FOR NEW OR REVISED DOCUMENTS, SPECIFICATIONS OR TEST REPORTS

ROUTE DOCUMENT OR TEST REPORT BEFORE RELEASING TO:

DOCUMENT OR TEST REPORT NUMBER (1)

UNCLASSIFIED TITLE (2)

CONTRACT NUMBER (3)	CONTRACT ARTICLE NO. (4)	CONTRACT ITEM NO. (5)	CONTRACT REQUIREMENT (6) ☐ YES ☐ NO

RESTRICTED DATA ATOMIC ENERGY ACT ☐ YES ☐ NO	DATA CLASSIFIED ☐ YES (7) ☐ NO	TYPE OF RELEASE: ☐ ORIG ☐ REV (8)	MODEL (9)

ISSUE TO THE FOLLOWING:	KEEP UP TO DATE ☐ YES ☐ NO	ORGN NO.	MAIL STOP	QTY	RESERVED DTN NO. OR TEL. EXT.	SHEETS ADDED	SHEETS REVISED
☐ ALL ACTIVE HOLDERS							
☐ ENGINEERING LIBRARY CAG							
		(10)	(10)	(10)	(10)		

DOCUMENT RELEASE

SHIPPING ORGN ATTENTION

ACCOMPANYING LETTER TO BE PROVIDED
☐ YES ☐ NO
☐ DTA ☐
☐ LTR NO. ☐

REPRO ORGN ATTENTION

DATE ORDERED:

BY:

TYPE OF PRINT	NO. OF COPIES
B&W	
REPRO	
MICRO-CARD	
☐	

ORIG TO:

DATE ISSUED:

COPIES ORDERED

REPRODUCIBLES _____

JSC _____

BOEING INTERNAL _____

TOTAL COPIES _____

☐ I have verified that all persons or organizations listed, above, to receive copies of this new or completely revised data have a need to know.

☐ Please remove the above name(s) or organization(s) from the above distribution list.

(11) RELEASE AUTHORIZED BY

ORGN NO. (12)

POOL/SWA

MAIL STOP (13)

TEL. EXT. (14)

DATE (15)

REMARKS (16)

DO-6000-2060 REV. 4/87

ROUTING: WHITE - RELEASE UNIT
CANARY - ORIGINATING ORGN.

ATTACHMENT B TO APPENDIX E
DRAWING/PARTS LIST AUTHENTICATION RECORD
FORM AND PREPARATION INSTRUCTIONS

Instructions for the preparation of the Drawing/Parts List Authentication Record.

Use the following instructions to complete each block on the form:

1. Enter the drawing number and the number of revised drawing sheets (not the drawing sheet numbers). For a separate parts list, enter the parts list number and the number of sheets. For a Book–Form Drawing (BFD) enter the drawing number and the sheet number entry, enter BFD.

2. Enter the revision level of the drawing.

3. Enter the dataset name for the computer generated drawing and the computer prepared parts list.

4. Print or legibly write the signature of the person signing for the indicated function.

5. Enter the date that the signature is added

6. Enter the organization number of the person signing for the indicated function.

7. Enter the phone number of the person signing for the indicated function.

8. Enter any pertinent comments regarding limitation, production notes, etc.

DRAWING/PARTS LIST AUTHENTICATION RECORD

DRAWING NUMBER			NO. OF SHEETS	REV.
DRAWING DATA SET NAME				
PARTS LIST NUMBER			NO. OF SHEETS	REV.
PARTS LIST DATA SET NAME				

	DATE	ORG. NO.	PHONE NO.	LIMITATIONS
DRAWN				
CHECKED				
ENGINEER				
MATERIALS & PROCESSES				
STRUCTURES				
QUALITY ENGINEERING				
MANUFACTURING				
QUALITY ASSURANCE				
ORGANIZATION				
PROJECT MANAGEMENT				
DRAWING QUALITY ASSURANCE				

NOTE: IF NOT USED FOR SIMULTANEOUS DRAWING AND PARTS LIST AUTHENTICATION, INDICATE N/A IN EITHER THE DRAWING NUMBER OR PARTS LIST NUMBER BLOCK AS APPLICABLE.

(This page reserved)

APPENDIX F DEVIATIONS AND WAIVERS

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FIGURES

ATTACHMENTS

F.1 SCOPE

CIs will not be accepted for delivery when there is a known departure from specification, drawings, documents, or associated lists, unless such departures have been approved by the NASA Contracting Officer or an appointed representative. This authorization will be in the form of an approved deviation or waiver.

F.2 DEFINITIONS

Deviation – Written, contractual authorization granted by the allocating/controlling team (customer) and/or NASA prior to the manufacture of an item, to depart from a particular performance or design requirement contained in an contractual specification or other document requirement before the departure is made, for a specific number of units or a specific period of time. A customer approved deviation allows delivery of the changed end item without being contractually non responsive and without necessitating correction or revision of applicable documentation. A deviation does NOT involve revision of the applicable item specification or drawing.

Waiver – Written, contractual authorization granted by the allocating/controlling team (customer) to depart from a performance or design requirement, contained in a contractual specification or other required document, discovered during or subsequent to manufacture of an item, for a specific number of units and/or a specified period of time. A waiver does NOT require revision of the applicable specification or drawing. A waiver permits acceptance or use of the item when it does not meet specified requirements.

Program RFD/RFW – A request for departure to a requirement allocated/identified by the Prime contract between Boeing and NASA.

Team RFD/RFW – A request for departure to a requirement allocated/identified by the procurement packages between Boeing and the PGs. Authority for approval is provided by the Prime (Boeing).

F.3 GENERAL REQUIREMENTS AND GROUNDRULES

a. RFDs will be processed for departures from an item's performance or design requirements as established in specifications, drawings, or elsewhere which are forecast prior to an items manufacture as necessary or unavoidable. An RFD is temporary in that it is for a specific number of units (not all) or a specific period of time (see paragraph 3.c.4).

b. RFWs will be processed for departures from the established configuration identification which are the result of unforeseen errors occurring during manufacture of an item, and which are found either during the items manufacture or after it has been submitted for inspection. An RFW will be processed only if the item is suitable for use "as is". An RFW is processed only for the affected unit(s).

c. Often it is difficult to determine the appropriate request. The following is offered to assist in clarifying the distinction between RFDs and RFWs.

1. Manufacture by the contractor, a subcontractor, or a vendor does not refer solely to production in the production phase or post product baseline establishment phase of a program, but to the process of building, making, coding, etc., a deliverable or testable item in any program phase.

2. The item for which an RFD/RFW is being processed may be a configuration item (hardware or software), and assembly, a subassembly, or any part thereof (including raw material).

3. RFDs provide the customer the opportunity to veto a departure before resources are expended to manufacture the non–conforming item. RFWs document unplanned manufacturing errors and seek after–the–fact customer authorization for resources already spent on non–conforming items. (It should be noted that the customer can always disapprove an RFD or RFW. Consequently, it is in the best interest of the PG/supplier to identify departures prior to manufacture as deviations, since in the case of post manufacture disapproval, hardware tear down may be required, as well as remanufacturing and/or retest.)

4. A temporary departure is actually permanent for a specific part, unit, or system. The term "temporary" refers to a limitation on the expected in–line effectivity of the deviation. For example, an approved deviation against a given serial number is a permanent change for that serial numbered part. A request for authorization for a "full effectivity" permanent departure will be processed as a change. In the case of a recurring deviation/waiver, it is probable that either the requirements of the documentation are too restrictive or that corrective action is ineffective – a change is required.

d. To further clarify the "before the fact, after the fact" distinction between the RFD and the RFW, the following guidelines will apply. If Prime/PG was to substitute a non–approved piece part which is in stock for an approved piece part that is temporarily not available, an RFD will cover this situation if the RFD is submitted to the customer and approved prior to using the non–approved piece part. If the piece part has already been incorporated in a manufactured item, then an RFW will need to be processed. In all cases, RFD/RFW designation criteria of MIL–STD–480B will be followed in accordance with the designation criteria discussed in the next section.

F.4 DESIGNATION CRITERIA

a. There is no simplified interpretation for designation of deviations/waivers as minor, major, or critical. ISSA Program Team members will refer to MIL–STD–480B for designation determination. A checklist will be developed and included in an update to Appendix F. In the interim, the following guidance is provided to aid in the determination.

b. Impacts to performance, weight and size, interchangeability, reliability, survivability, maintainability or durability will be assessed with respect to the applicable specification. If

the impact is of such a degree that system specification requirements can no longer be met, the departure will be designated <u>major</u>. However, if the impacts due to the departure are such that the specification requirements can still be achieved, as determined by analysis, the departure will be designated <u>minor</u>.

c. In cases where evaluation of the criteria has established the departure to be major or critical, a careful evaluation of the need for deviation/waiver will be considered.

F.5 INTEGRATED RFD/RFW PROCESS

Request for Deviation or Request for Waiver will be processed as defined here and as shown in Figure F–1.

F.5.1 TECHNICAL DEFINITION/PRE–COORDINATION PHASE I:

a. Prime/PG identifies non–conformance and/or need for departure to established formal program and contract technical baselines.

b. Similar to the ISSA Integrated Change Process, the originator initiates technical coordination with internal and external IPT/AIT members he/she has identified as potentially affected, and prepares <u>draft</u> DD Form 1694.

c. Originator will obtain a RFD/RFW identification number from the site CM AIT Representative. Originator transmits a draft RFD/RFW package with supporting documentation to Team technical counterparts (including Safety and Mission Assurance) for technical agreement.

d. Upon reaching technical agreement and type designation concurrence (Program or Team RFD/RFW), the originator prepares a complete request package using MIL–STD–480B as a guide and instructions in Attachment A for DD Form 1694s and forwards to the site CM AIT Representative. The originating site CM AIT Representative will verify the type designation (Program or Team) and transmit the coordinated package to the ISSA CM Receipt Desk. In parallel, the Originator will forward the package to Contracts for formal transmittal to Prime Contracts. Minimum content of the requests will address the following:

    a. Originating Prime/PG Team

    b. Applicable contract and Type Designation (Program or Team RFD/RFW)

    c. Affected Items/Quantities

    d. Part Number and Nomenclature

    e. Specification and/or Drawing Affected

    f. Nature of Departure (detailed description)

    g. Rationale for recommended disposition

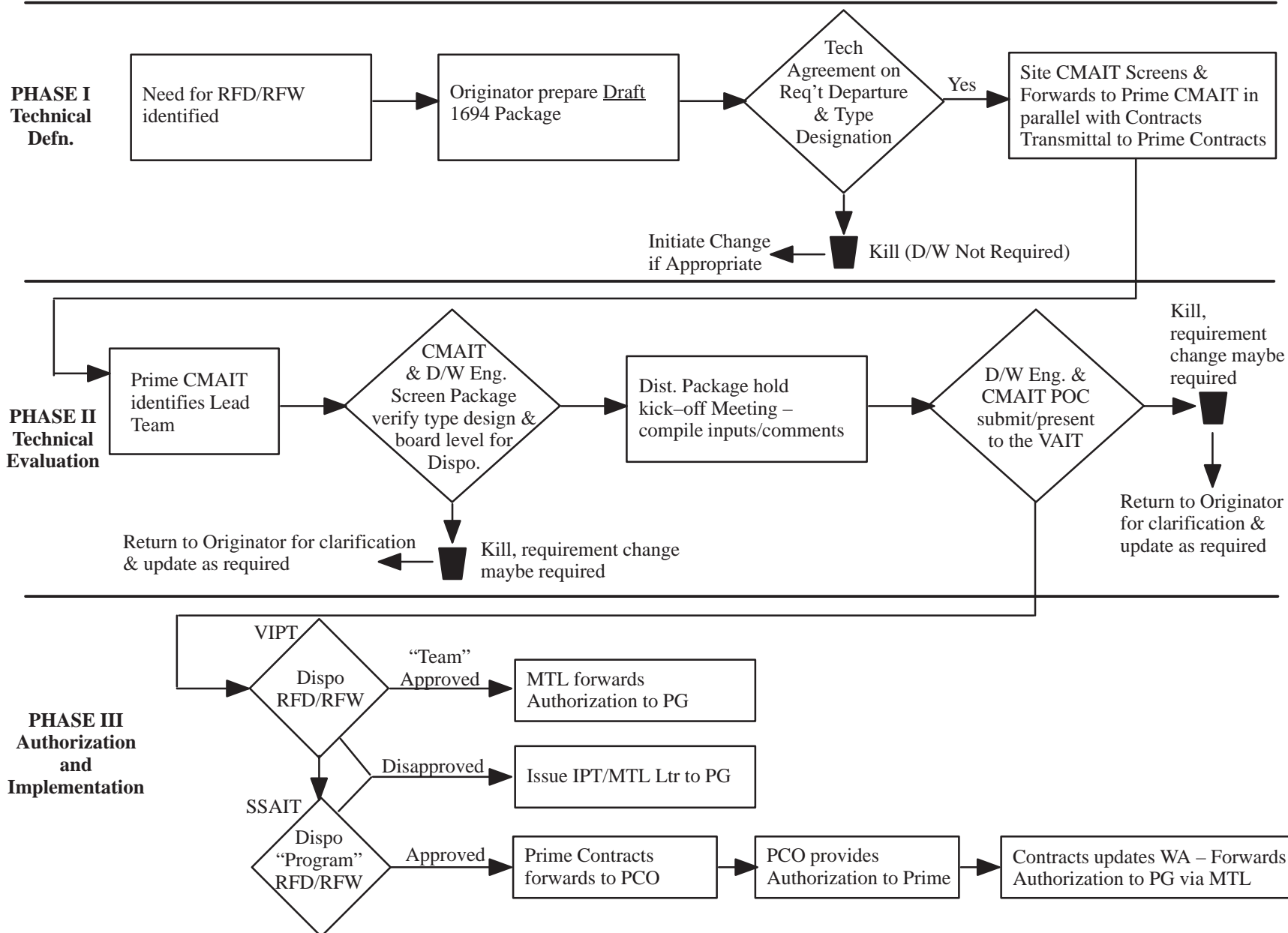   h. Cause of Departure

TEAM AND PROGRAM RFD/RFW PROCESS FLOW

PHASE I Technical Defn.

Need for RFD/RFW identified → Originator prepare Draft 1694 Package → Tech Agreement on Req't Departure & Type Designation

— Yes → Site CMAIT Screens & Forwards to Prime CMAIT in parallel with Contracts Transmittal to Prime Contracts

Kill (D/W Not Required) → Initiate Change if Appropriate

PHASE II Technical Evaluation

Prime CMAIT identifies Lead Team → CMAIT & D/W Eng. Screen Package verify type design & board level for Dispo. → Dist. Package hold kick–off Meeting – compile inputs/comments → D/W Eng. & CMAIT POC submit/present to the VAIT

Kill, requirement change maybe required

Kill, requirement change maybe required → Return to Originator for clarification & update as required

Return to Originator for clarification & update as required

PHASE III Authorization and Implementation

VIPT — Dispo RFD/RFW
- "Team" Approved → MTL forwards Authorization to PG
- Disapproved → Issue IPT/MTL Ltr to PG

SSAIT — Dispo "Program" RFD/RFW
- Approved → Prime Contracts forwards to PCO → PCO provides Authorization to Prime → Contracts updates WA – Forwards Authorization to PG via MTL

FIGURE F–1 INTEGRATED RFD/RFW PROCESS FLOW

    i.   Reliability/Maintainability Impacts

    j.   Effect on Program Schedules

    k.   Serial Number Effectivity

    l.   Corrective Action

F.5.2 TECHNICAL EVALUATION/INTEGRATION PHASE II:

a. The CM AIT will receive all RFDs/RFWs for departures from established contract and/or program/technical baselines. This includes RFDs/RFWs from the PG to Prime Contractor (Team) and Prime to NASA (Program). International Partners and NASA Program Participants RFDs/RFWs will be addressed in a follow–on release to the Appendix.

b. The Screening/Classification and Disposition Process will begin when CM AIT identifies a temporary Space Station D/W Number. The number and associated data will be entered into CACTIS for tracking purposes at this time.

c. The CM AIT will be responsible for assigning the lead Team who will designate a RFD/RFW Engineer (Technical Focal). The CM AIT Representative and RFD/RFW Engineer will screen the package for completeness and appropriate type designation. If the package is properly classified, the appropriate IPT/AITs will be identified (mandatory review Teams will be identified as required, i.e., S&MA) for distribution of the package for evaluation (change evaluation form will be tailored for application to RFD/RFW assessment) and concurrence. Following distribution, a Technical Interface Meeting (TIM) will be conducted for Major and complex D/Ws as required.

d. Upon receipt of inputs from the IPT/AITs, the composite D/W package will be updated by the RFD/RFW Engineer. If comments are extensive or it has been determined that an Engineering Change Proposal (ECP) and SCN or Team Change Proposal (TCP) is required, or the D/W is improperly classified, the package will be returned to the originating site CM AIT Rep for further coordination and processing. This occurrence should be minimized if the D/W has been properly processed during the Technical Definition/Pre–Coordination Phase.

e   The CM AIT Technical Compliance Team, with support from the responsible RFD/RFW Engineer, is responsible for ensuring that the proper type designation (Program or Team) has been applied. The RFD/RFW Engineer with support from CM AIT Rep. is responsible for ensuring that the D/W has been properly screened and technically coordinated prior to submittal the to the appropriate control board/team for disposition.
Note: The control board/team will be that team which has allocation/control authority for the requirement which the proposed departure is against.

F.5.3 AUTHORIZATION AND IMPLEMENTATION PHASE III:

a. The allocating/controlling team will review and recommend the disposition for the RFD/RFW. For Program type RFDs/RFWs, the responsible IPT/AIT will recommend

disposition to the VAIT, followed by VIPT review and concurrence. If concurrence is obtained, the recommended disposition in Block 26b of DD Form 1694 is provided to the SSAIT chairperson for final disposition with signatures. For Team type RFDs/RFWs, the responsible IPT will recommend disposition in Block 26b. and VIPT will make final disposition in Block 26c. with signatures.

b. For Program type RFDs/RFWs with technical approval in Blocks 26b and c, the NASA procurement office will issue PCO authorization to the Prime.

c. Upon appropriate authorization, the Prime CMAIT/Technical Compliance Representative will ensure that D/W processing status is reflected/updated in the CACTIS data base. Disposition notification will be forwarded to the appropriate originating Teams by Prime Contracts for Program RFDs/RFWs, and Materiel for Team RFDs/RFWs.

d. The Prime CMAIT/Technical Compliance Representative will ensure that the complete configuration status accounting element data for the affected end item is entered into the CACTIS data base.

e. Contracts will modify the Work Authorization to update Part III, Annex 2 for approved Program RFDs/RFWs.

ATTACHMENT A TO APPENDIX F
DD FORM 1694 PREPARATION INSTRUCTIONS

Instructions for Preparation of DD Form 1694 (RFD/RFW)

1.   Enter originating ISSA contractor company, group, division name and address.

2.   Put an X in the appropriate box: either deviation or waiver. See attached ground rules for instructions on how to establish whether your departure is a deviation or waiver.

3.   Put an X in the appropriate box; either minor, major or critical. See designation criteria for instructions on how to establish this designation.

4.   Designation for Deviation/Waiver –

    a. Type – Enter Program or Team.

    b. Cage Code – Enter your company's Federal Supply Code.

    c. System Designation – Enter the system or highest level configuration item designation assigned by the U.S. Government.

    d. Deviation/Waiver Number – Numbers will be furnished by the CM AIT upon successful completion of Phase I (Technical Definition/Pre–Coordination)

5.   Baseline Affected –

Functional – The initial approved functional configuration. Usually established by the system specification. (Refers to those departures which are identified thru traceability to System Level Specifications)

Allocated – The initial approved allocated configuration identification – Part I of developmental specifications. (References to those departures which are identified through traceability to Prime Item Specifications)

Product – The initial approved or conditionally approved product configuration identification. (Refers to those departures which are identified through traceability to approved drawings or Part II (product) specifications.)

6.   Other Systems/Configuration Items Affected – Typically the answer to this question is No. If there are other systems/CIs affected, in all likelihood you would document all of them on the same deviation/waiver form.

7.   Specifications Affected – Test Plan – If the departure is one from or affecting a Specification or Test Plan enter the Specification or Test Plan number along with the manufactures code of the originator of the Specification or Test Plan. If your company/IPT/AIT is not the originator of the specification or test plan then traceability from the Prime Contractor Spec/Test Plan should be entered either in block 7 or 8, if known. In other words, the subcontractor document/drawing flowing down the prime

contract requirement, should be identified in conjunction with your manufacturing code. (Note: Both blocks 7 & 8 have rows for System, Item, and Test Plan. Enter your information in the applicable row.)

8. Drawings Affected – If the departure is one from or affecting a drawing, enter the appropriate drawing number and corresponding manufacturers code.

9. Title of Deviation/Waiver – The title should be brief but contain enough information to convey the type of departure which will be documented in Block 22.

9a. Weapon System Code or Designation – Enter ISSA for the designation code.

10. Contract Number and Line Item Number – Enter the applicable Contract Number and CLIN associated with the item identified in block 12.

11. Procuring Contracting Officer (PCO)– Enter name as appropriate or N/A.

12. Configuration Item Nomenclature – Enter the approved name/nomenclature for the CI

13. Classification of Defect – No Prime Contract requirement to classify defects, enter N/A.

14. Name of Part or Lowest Assembly Affected – Provide a complete descriptive name.

15. Part Number or Type Designation – Provide the part numbers for the items listed in block 14.

16. Lot Number – If your current production contract is set up for lot builds/purchases, enter the lot number from which the departure applies. If your production contract is not structured for lot builds/purchases, enter N/A.

17. Quantity – Enter the total quantity of parts for which you are requesting the deviation/waiver. This block must be completed.

18. Recurring Deviation/Waiver – A deviation/waiver is recurring if the same departure (documented on a separate deviation/waiver form) has been approved on another contract or lot. If "yes" is checked then block 23 should reflect the previous contract and deviation/waiver number.

19. Effect on Cost/Price – There is normally a price difference associated with all deviations/waivers. A majority of deviations/waivers tend to be part substitutions. In cases such as this where alternate parts are being utilized, state the difference in price between the preferred and substitute parts. These prices must be specified. To state that the price is the same is not sufficient. For instances when the nature of the departure does not lend itself to a dollar value delta between what is required and what is actually being provided, state that there is a change in price, cost or fee is considered equitable. A statement like this must be followed by an explanation of why.

20. Effect on Delivery Schedule – Identify impact to requalification, delivery or program schedules.

21. Effect on Integrated Logistic Support, Interfaces, etc. – If there is no effect, so state. Use continuation page if more space is needed to explain impact.

22. Description of Deviation/Waiver – Describe in detail the nature of the departure or proposed departure from the technical requirements of the configuration identification. Describe the effect, where applicable, on each of the following: health, performance, interchangeability, reliability or maintainability, effective use or operation, weight and appearance.

23. Need for Deviation/Waiver – Explain why you cannot comply with your requirements within the allocated contractual time frame. Also explain why a deviation/waiver is being submitted/proposed and not a permanent design change. State the steps being taken to avoid future recurrence.

24. Serial Number(s) Affected – The serial numbers must be specified. N/A is not acceptable. Full effectivity departures should not be documented via deviations/waivers, but as Class I and TCPs as appropriate.

25. Submitting Activity Authorized Signature – An authorized representative of your program/company must sign this block.

25a. Title – The appropriate title of the individual signing block 25 must be entered.

26. Approval/Disapproval – Appropriate IPT, NASA co–lead and Board chairperson signatures will be entered here.

APPENDIX G ISSA CONFIGURATION ACCOUNTING

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FIGURES

G.1 SCOPE

G.1.1 CONFIGURATION STATUS ACCOUNTING FUNCTIONAL RESPONSIBILITIES

Configuration Accounting for the ISSA program is accomplished using CACTIS to record and report change processing, change commitments, deviation and waiver data and Configuration Status Accounting (CSA). The configuration status accounting systems will be developed and maintained to support the requirements as specified in SSP 41170, Configuration Management Requirements, and are described in the following sections:

a. Configuration Status Accounting

b. Change Tracking, Change Commitments

G.2 CONFIGURATION STATUS ACCOUNTING

G.2.1 PURPOSE

Configuration Status Accounting provides the information necessary for the following:

a. Management visibility in the accomplishment of tasks related to traceability of configuration baselines and changes thereto

b. Accurate completion of manufacturing and quality assurance requirements (as planned/as built, as–tested for Hardware/Software compared with the as–authorized/as–designed configuration). CACTIS will provide the as–designed/as–authorized configuration for specific CI/CSCIs. The quality assurance functions perform the as designed to as–built audits.

Additionally, the Configuration Status Accounting system provides a process to do the following:

a. Account for the configuration of all CIs/CSCIs identified in the ISSA specification tree

b. Provide traceability of configuration baselines and changes to those baselines including a system of computerized reports and records which track the effectivity of approved committed changes for each deliverable CI/CSCI

c. Provide reports and records for Program management and for ISSA program reviews

G.2.2 CONFIGURATION STATUS ACCOUNTING PROCESS

The generic CSA process is described in Figure G–1.

The PGs will implement and maintain their CSA systems. On an as–requested basis, the PGs will provide to the Prime, CSA reports similar to the format described in Figure G–2
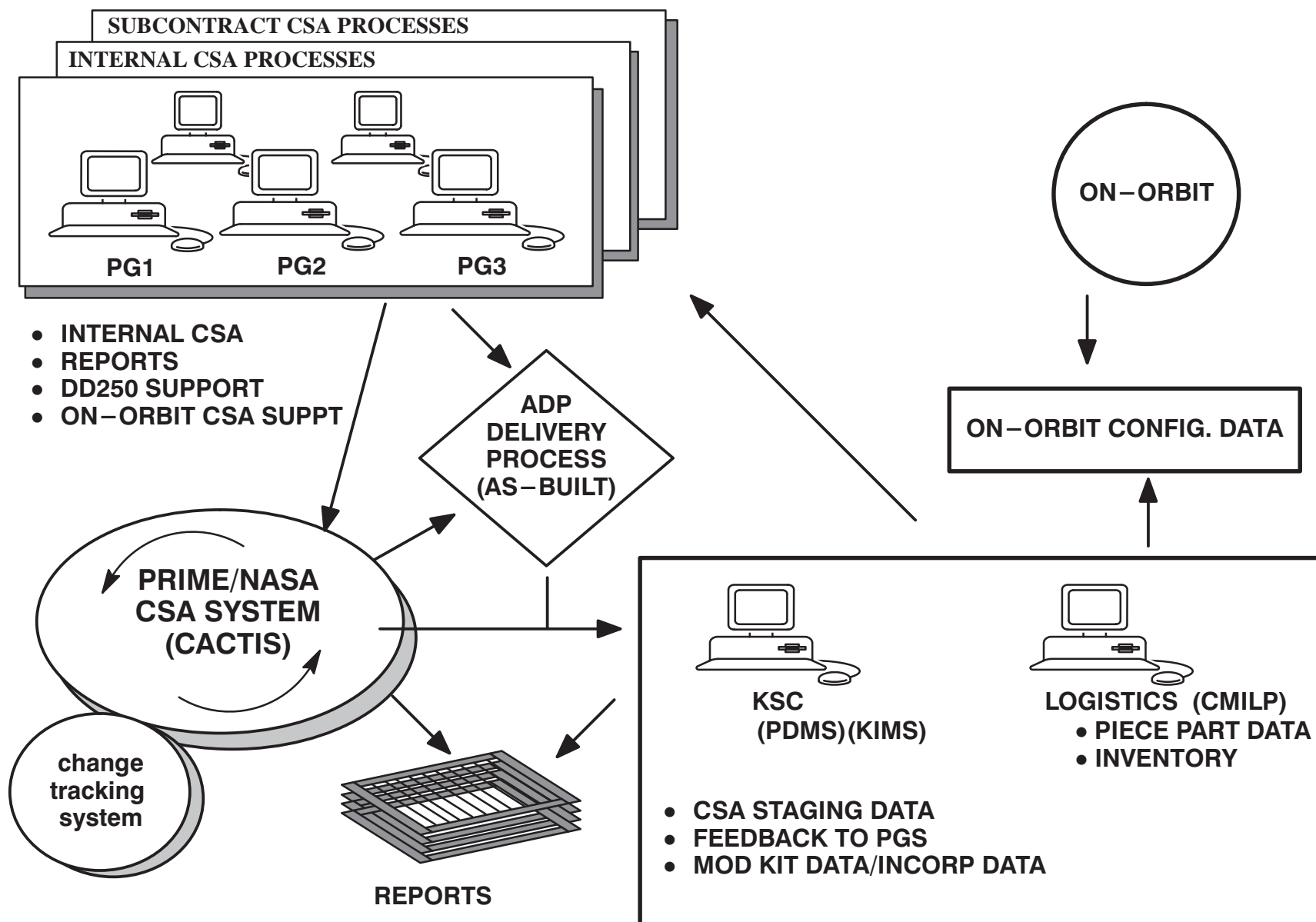
SUBCONTRACT CSA PROCESSES

INTERNAL CSA PROCESSES

PG1   PG2   PG3

- INTERNAL CSA
- REPORTS
- DD250 SUPPORT
- ON−ORBIT CSA SUPPT

ADP DELIVERY PROCESS (AS−BUILT)

PRIME/NASA CSA SYSTEM (CACTIS)

change tracking system

REPORTS

ON−ORBIT

ON−ORBIT CONFIG. DATA

KSC (PDMS)(KIMS)

LOGISTICS (CMILP)
- PIECE PART DATA
- INVENTORY

- CSA STAGING DATA
- FEEDBACK TO PGS
- MOD KIT DATA/INCORP DATA

FIGURE G−1 CONFIGURATION STATUS ACCOUNTING FLOW

CONFIGURATION ITEM/CHANGE RECORD REPORT

Number: Name: Used On: Type: WBS Number:

CI–234678   LCS Part A   Liquid Cooling System   HWC   1.6.8.4.3

Baseline Part#/Version#:   234678–1   PCA Date: 2/3/95   Current Part#/Version#:   234678–2

Prime Contractor Name: Boeing   Contractor Name: PG3   Subcontractor Name:

Cage Code: 2B945   Cage Code: 3A768   Cage Code:

SSCN/#Rev		Change#	Team	Type	Effectivity	Version#	Version#	Serial#	Serial#	Kit P/N	Date	Date	DIL	Status
SSCN 150	R00	95–01A	PG2	ECP	Flight 1A	234678–1	234678–2	11334	11335	KIT 225	12/5/95	1/3/95	65B	Accepted
SSCN 134	R00	77–999C	PG1	TCP	Flight 2B	234678–1	234678–2	224	225	KIT 688	2/7/95			Submit
SSCN 77	R00	459A	PG3	ECP	Flight 1A	234678–1	234678–2	451	452	KIT 44	3/7/95			New
SSCN 188	R00	92349	PG1	ECP	Flight 1A	234678–2	234678–3	567	568	KIT 66				New

DEVIATIONS/WAIVERS

KIT DETAILS

Number: Name: Used On: Type: WBS Number:

CI–234678   LCS Part A   Liquid Cooling System   HWC   1.6.8.4.3

Type	Number	Status	Date Closed	SSCN	Revision	Serial #'s Affected
Deviation	13459	Open		SSCN77	R101	S23498
						S66677
Waiver	4598	Closed	12/15/94			S88733
Deviation	4601	Open				
Deviation	16688	Closed				

Kit P/N: 225
Complete Inc Date: 1/5/95

Serial #	Act Inc Date
11334	12/5/94
11335	12/7/94
11336	12/9/94
11340	1/2/95

FIGURE G–2 CONFIGURATION ITEM/CHANGE RECORD REPORT

incorporating the agreed to data elements as listed in Figure G–3. The PGs have the option to enter CSA related data into CACTIS. If this is the case, the PGs will perform data entry on an as–required basis (as changes occur to baselines).

G.2.2.1 PRODUCT GROUP RESPONSIBILITIES

The PGs will do the following:

a. Develop and implement an internal Configuration Status Accounting system

b. Provide CSARs in accordance with the contractual requirements

c. Maintain and update their Configuration Status Accounting database as changes occur

d. Support Boeing Prime during reviews and audits with Configuration Status Accounting data as necessary

e. Support DD1149 and DD250 (CI/CSCI acceptance) activity as required

f. Update Configuration Status Accounting databases with modification kit incorporation data

g. Verify that released engineering (as–designed) plus changes thereto agrees with manufacturing records (as–built)

G.2.2.2 BOEING PRIME RESPONSIBILITIES

The Boeing Prime will do the following:

a. Administer and verify that the CSA systems are in compliance with the contractual requirements.

b. Incorporate CSA reports from and/or monitor CACTIS Data Entry Groups into the CACTIS database.

c. Provide access, as required to the CACTIS CSA database.

e. Provide assistance in delivering modification kit feedback to the Product Groups from KSC.

f. Assist Technical Compliance in the performance of audits of the Product Groups CSA processes.

g. Act as the CSA focal point for the ISSA program.

h. Support the DD–1149 and DD–250 processes as required.

G.3 CHANGE TRACKING

G.3.1 PURPOSE

The purpose of Change Tracking is to provide ISSA management with visibility into changes in process, as well as, the health of the process itself. The capabilities required to accomplish this include the following:

CSA DATA ELEMENTS

CI NUMBER
CI TITLE
USED ON CI NUMBER
CI TYPE
WBS NUMBER
BASELINE P/N
PCA DATE
CURRENT P/N
PRIME CONTRACTOR NAME
CAGE CODE
CONTRACTOR NAME
CAGE CODE
SUBCONTRACTOR NAME
CAGE CODE
SSCN NUMBER
REVISION
TYPE
RELATED CHANGE NUMBER
TEAM IDENTIFICATION
EFFECTIVITY
FROM/TO P/N
SERIAL NUMBER RANGE
KIT P/N
ACT INC DATE
DD1149 DATE
CLIN/DIL NUMBER
STATUS
DEV/WAIV NUMBER
D/W STATUS
DATE CLOSED
SSCN NUMBER
SSCN REV
SERIAL NUMBERS AFFECTED

FIGURE G–3 CONFIGURATION STATUS ACCOUNTING DATA ELEMENTS

a. Support for the Change Management Team in identifying and tracking changes through the change process

b. Support for the Change Commitment Board in identifying and tracking change commitments as they relate to changes

c. Support for ISSA personnel to receive reports and information regarding changes and change metrics

G.3.2 CHANGE TRACKING PROCESS

The change tracking process flow is shown in Figure G–4. This process is supported by the CACTIS consisting of a database with supporting applications. CACTIS provides the following:

a. Processing schedule for each Program change, covering key milestones throughout the change process

b. Status and metrics regarding PCM/CCM review by PGs and/or International Partners/Participants

c. Current status of each program change in process against the planned change schedule

d. Data elements about each program change for the purpose of identifying impacts, points–of–contact, remarks, and other critical data

e. Data regarding change commitments that identify plans for implementing the change via IPT/AIT materiel commitments

f. Reports that summarize information about a program change or group of changes (in either hardcopy or online format)

g. Metric reports that summarize the overall process performance in terms of flow time, schedule performance, backlog, and change rate

h. Ad–hoc report capabilities to allow users to create reports as needed from the information available
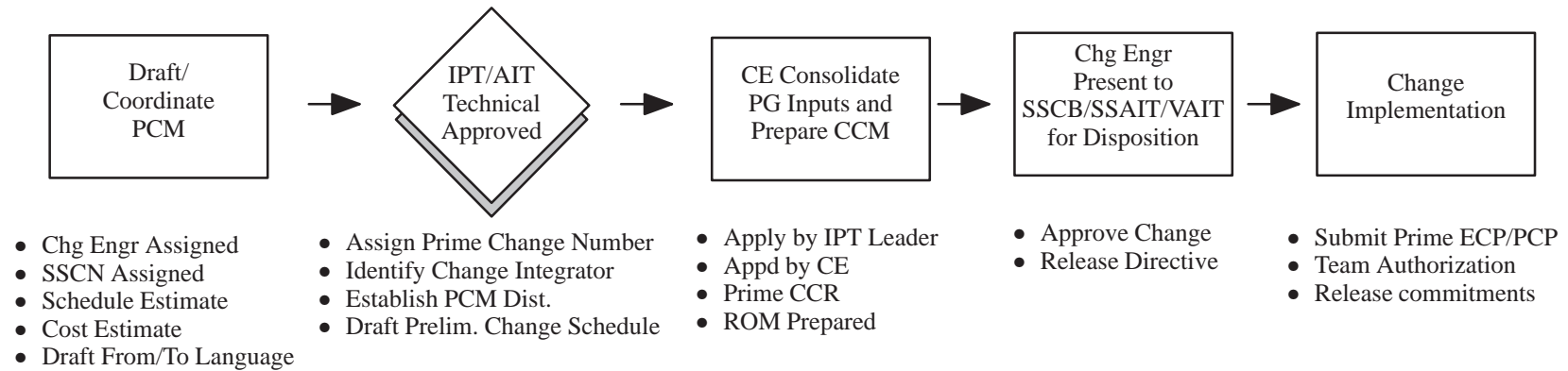
Each phase of the process as identified in Figure G–4 and will be addressed in the following sections. The figures referred to in this section depict the CACTIS input screens that will be used for inputting data. As these screens are developed, the input screens, screen legends, and responsibility matrix will be described in the "CACTIS Users Guide." The data elements are relational; therefore, data entered on one screen will not have to be re–entered on subsequent screens. The responsibility matrix for data entry by element is also defined in the Users Guide.

G.3.2.1 DRAFT/COORDINATE PRELIMINARY CHANGE MEMO PHASE

The Draft/Coordinate Preliminary Change Memo phase is depicted in Figure G–4, and will generally start the CACTIS process. The first event is for the Change Integrator to enter the SSCN number and summary details associated with the change in CACTIS under "General Information."

CHANGE PROCESS FLOW:

```
┌──────────────┐      ◇◇◇◇◇◇◇       ┌──────────────┐   ┌──────────────┐   ┌──────────────┐
│   Draft/     │      IPT/AIT        │ CE Consolidate│   │   Chg Engr   │   │              │
│  Coordinate  │ →   Technical    →  │ PG Inputs and │ →│  Present to   │ →│    Change    │
│     PCM      │      Approved       │  Prepare CCM  │   │SSCB/SSAIT/VAIT│   │Implementation│
└──────────────┘      ◇◇◇◇◇◇◇       └──────────────┘   │ for Disposition│  └──────────────┘
                                                         └──────────────┘
```

- Chg Engr Assigned
- SSCN Assigned
- Schedule Estimate
- Cost Estimate
- Draft From/To Language

- Assign Prime Change Number
- Identify Change Integrator
- Establish PCM Dist.
- Draft Prelim. Change Schedule

- Apply by IPT Leader
- Appd by CE
- Prime CCR
- ROM Prepared

- Approve Change
- Release Directive

- Submit Prime ECP/PCP
- Team Authorization
- Release commitments

CACTIS INPUT/STATUS RESP:

CHANGE INTEGRATOR

CHANGE INTEGRATOR

CHANGE INTEGRATOR
PP&C IPT/AIT REP

CHANGE INTEGRATOR
PP&C AIT/IPT REP
ERU

CHANGE INTEGRATOR
PP&C AIT/IPT REP
ERU

See CACTIS User Guide for specific Data Entry Elements

FIGURE G–4   CHANGE TRACKING FLOW

If known at this time, the Documents Affected will be entered using the "Documents Affected" input screen.

G.3.2.1.1 Data Elements

Input screens associated with the "General Information" and "Document Affected" are identified in the CACTIS Users Guide.

G.3.2.1.2 Responsibilities

The data for these screens will be entered by the responsible Change Integrator.

G.3.2.2 IPT/AIT TECHNICAL APPROVAL PHASE

The IPT/AIT Technical Approval phase is depicted in Figure G–4 and will most likely occur before the Technical Approval meeting. The CACTIS input screens associated with this phase will need to be updated or finalized from a period of just before, to just after the Technical Approval meeting.

At this time, any remaining information required for CACTIS "General Information" input screen should be entered. Specifically, the Prime Change Number, Prime Points of Contact, and any other summary details.

In addition to completing the general information input required for the change, the preliminary change schedule should be entered into CACTIS. The "Change Scheduling" input screen is defined in the "CACTIS Users Guide."

Also, the PCM team impacts should be known at this time and can be entered into CACTIS in the "Team Impact" input screen.

G.3.2.2.1 Data Elements

a. Any remaining elements required for "General Information" or "Document Affected."
b. Elements associated with scheduling milestones and Team impacts.

G.3.2.2.2 Responsibilities

The data for these screens will be entered by the responsible Change Integrator.

G.3.2.3 CHANGE EVALUATION, CONSOLIDATE PRODUCT GROUP INPUTS, AND PREPARE COMPOSITE CHANGE MEMO PHASE

The Change Evaluation, Consolidate PG Inputs, and prepare CCM phase is depicted in Figure G–4 and occurs when the CCM is prepared and the preliminary CCR is developed and available.

At this time, the Change Integrator is statusing the change development schedule. Also, the CCR is being developed and entered into CACTIS.

G.3.2.3.1 Data Elements

a. Any statusing of the change schedule

b. CCR related information input screens

G.3.2.3.2 Responsibilities

a. Statusing of change schedule information will be accomplished by the Change Integrator.

b. Initial inputs for the "CCR" input screens will be the responsibility of the IPT/AIT PP&C Representative.

c. Statusing of the CCR events will be the responsibility of the IPT/AIT PP&C Representative with the exception of the ERU release dates which will be the responsibility of the ERU group.

G.3.2.4 CHANGE ENGINEER PRESENT TO SPACE STATION CONTROL BOARD/IPT/AIT FOR DISPOSITION PHASE

The Change Engineer Present to SSCB/IPT/AIT for Disposition phase is depicted in Figure G–4 and occurs when the Change Directive is approved and released. This is when the majority of change tracking/statusing will take place.

G.3.2.4.1 Data Elements

Continued statusing of all areas of CACTIS.

G.3.2.4.2 Responsibilities

a. The ERU release dates will be statused by the ERU group.

b. CCR schedule data will be statused by the IPT/AIT PP&C Representative. Change data will be statused by the Change Integrator.

G.3.2.5 CHANGE IMPLEMENTATION PHASE

The Change Implementation phase includes the continued monitoring and statusing of CACTIS by all parties with write capabilities. Additionally, this is the time that metrics will be generated.

G.3.2.5.1 Data Elements

Generally all elements associated with CACTIS.

G.3.2.5.2 Responsibilities

a. The continued statusing of CACTIS is the responsibility of the Change Integrator, IPT/AIT PP&C Representative, and ERU.

b. The generation of metrics from the CACTIS is the responsibility of the Database Administrator.

G.3.3 CHANGE TRACKING FUNCTIONAL RESPONSIBILITIES

G.3.3.1 PRODUCT GROUP MAJOR TIER II SUBCONTRACTOR FLOWDOWN

The CMAIT will track and status Major Tier II Subcontractor Flowdowns in the Change and Commitment Tracking Information System (CACTIS) database. The Data Elements to be tracked are shown in report format in Figure G–3.

The Prime CMAIT will issue the latest Major TIer II Subcontract Flowdown status to the PGs to support a once a month status update to the Prime. This will be considered an informal delivery of data. The status will be reviewed monthly via Telecon.

G.3.3.2 BOEING PRIME RESPONSIBILITIES

The Boeing Prime will do the following:

a. Issue the CACTIS Major Tier II subcontractor flowdown status report tot he PGs on a monthly basis.

b. Update the CACTIS database as required.

c. Provide status reports to ISS Program management as required

G.3.3.3 PRODUCT GROUP RESPONSIBILITIES

The Product Groups will do the following:

a. Develop and maintain process for tracking Tier II Subcontract flowdown

b. Update CACTIS Tier II Subcontractor flowdown report with current status on a monthly basis

c. Provide Tier II flowdown status to the Prime on a monthly basis.

(This page reserved)

APPENDIX H CONTRACT ENGINEERING AND CONTRACT TECHNICAL COMPLIANCE

TABLE OF CONTENTS

H.1 NASA CONTRACT ENGINEERING

NASA Contract Engineering functions primarily involve the precoordination of changes and the management of Technical Evaluations. These processes are described in the following paragraphs and figures of this appendix:

H.1.1 PRECOORDINATION OF CHANGES

All potential Class I changes will be precoordinated with the NASA Manager of Configuration Management and the NASA Manager of Business Management. NASA Contract Engineering personnel will attend and support the VAIT, VIPT, Operations, and Utilization AIT meetings to obtain information on impending changes affecting the contract baseline and/or Space Station funding reserves. Precoordination will occur during the initial three stages of the change process at the following points: the initiation of a proposed change; approval of a PCM; and approval of a CCM. (See Figure H–1.) No further precoordination is required following approval of a CCM. Figure H–1 presents a graphical view showing where precoordination fits into the integrated change process flow.

H.1.1.1 PRECOORDINATION OF PROPOSED CHANGES

Contract Engineers will be cognizant of all potential changes that are being discussed by the IPTs they are assigned to support. Contract Engineers will ensure that they are aware of and attend all IPT discussions that involve potential or proposed changes. The Contract Engineers will gather data on technical pros and cons and rough cost estimates/guesses and will be empowered to represent the NASA Configuration Management Manager and the NASA Business Management Manager in the precoordination/decision process. The NASA Configuration Management Manager and NASA Business Management Manager will participant in VAIT, OAIT, or UAIT go/no–go decisions (approval to develop a PCM) on all changes either directly or through empowered Contract Engineers. This Business Management opinion at the VAIT, OAIT, or UAIT is critical since any change approved for PCM development will begin to incur proposal preparation costs. Changes which do not fix broken requirements and are clearly an enhancement are prime candidates to be killed. Also any change which appears to be a design solution at or below the product group level should be killed at the respective AIT board meeting.

Contract Engineers will collect and maintain data on each change. This data will include the following: brief descriptions; technical and business pros and cons; cost estimate; change classification; Office of Primary Responsibility (OPR)/Team of Primary Responsibility (TPR); and recommendations. This information will be prepared on all changes consistently in the above order.
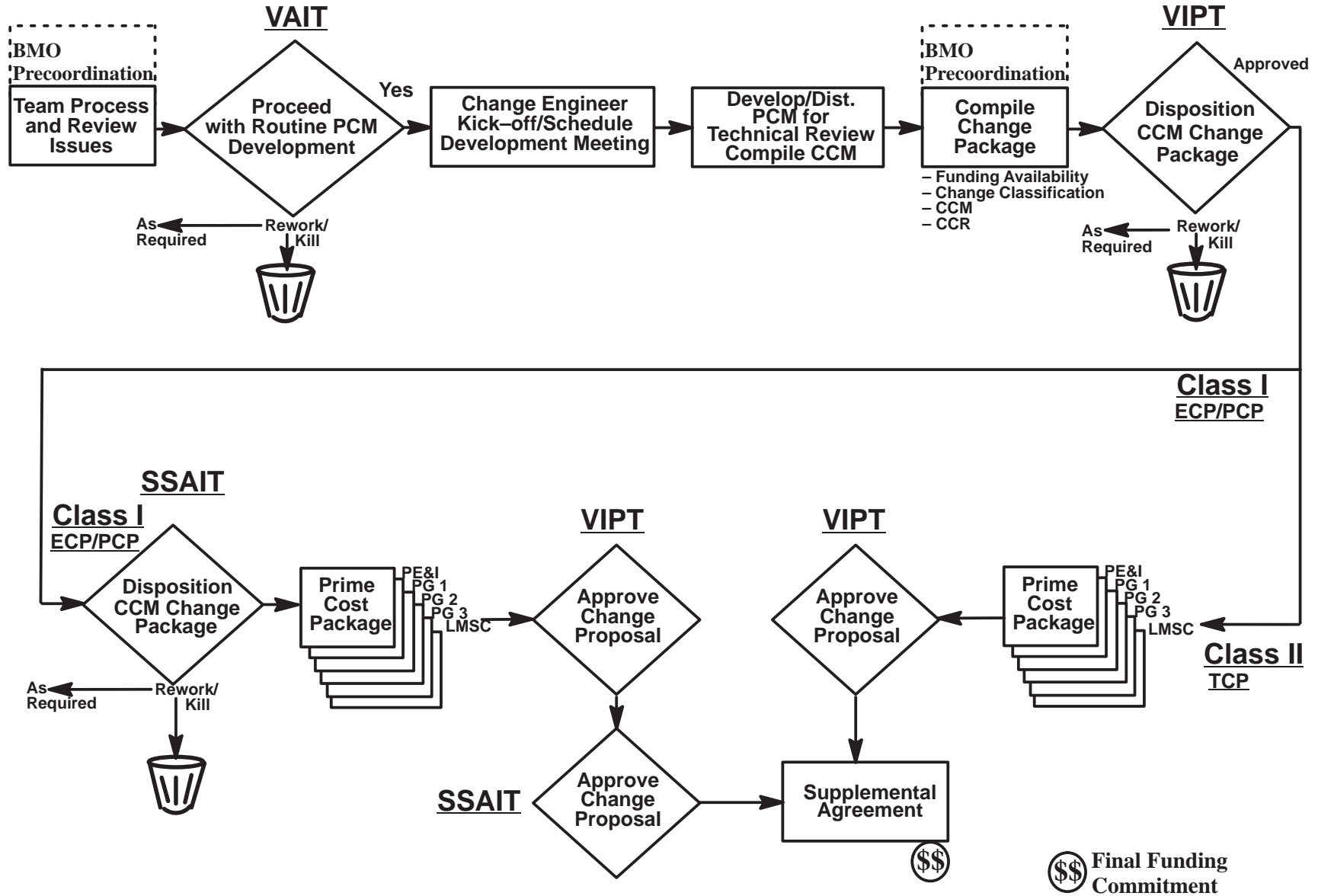
VAIT

BMO Precoordination

Team Process and Review Issues

Proceed with Routine PCM Development — Yes →

Rework/Kill → As Required

Change Engineer Kick–off/Schedule Development Meeting

Develop/Dist. PCM for Technical Review Compile CCM

BMO Precoordination

Compile Change Package
– Funding Availability
– Change Classification
– CCM
– CCR

VIPT

Disposition CCM Change Package — Approved

Rework/Kill → As Required

Class I
ECP/PCP

SSAIT

Class I
ECP/PCP

Disposition CCM Change Package

Rework/Kill → As Required

Prime Cost Package
PE&I
PG 1
PG 2
PG 3
LMSC

VIPT

Approve Change Proposal

SSAIT

Approve Change Proposal

Supplemental Agreement
$$

VIPT

Approve Change Proposal

Prime Cost Package
PE&I
PG 1
PG 2
PG 3
LMSC

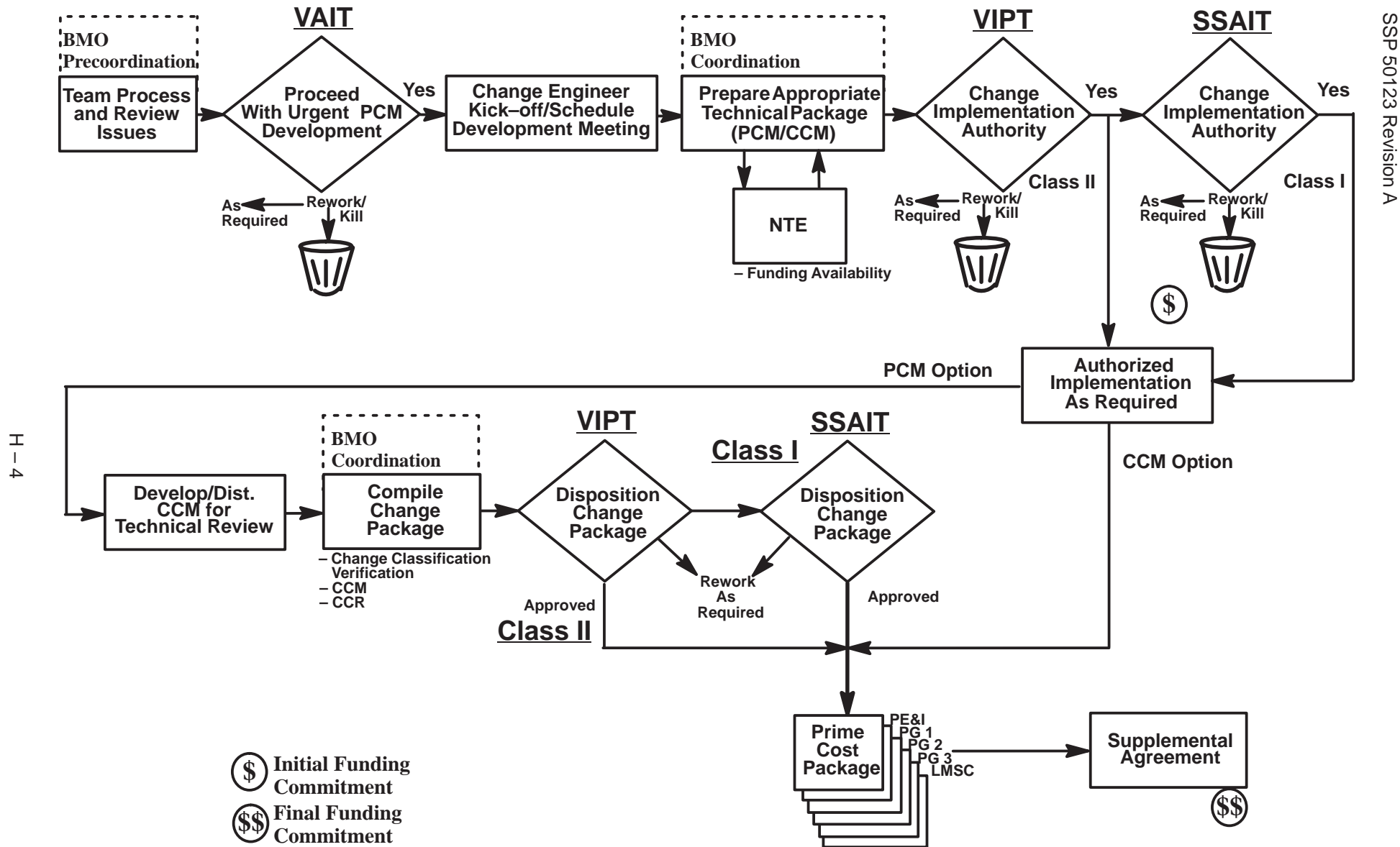**Class II**
TCP

$$ Final Funding Commitment

FIGURE H–1.1   INTEGRATED CHANGE PROCESS FLOW, ROUTINE IMPLEMENTATION WITH CONTRACT ENGINEERING FUNCTION

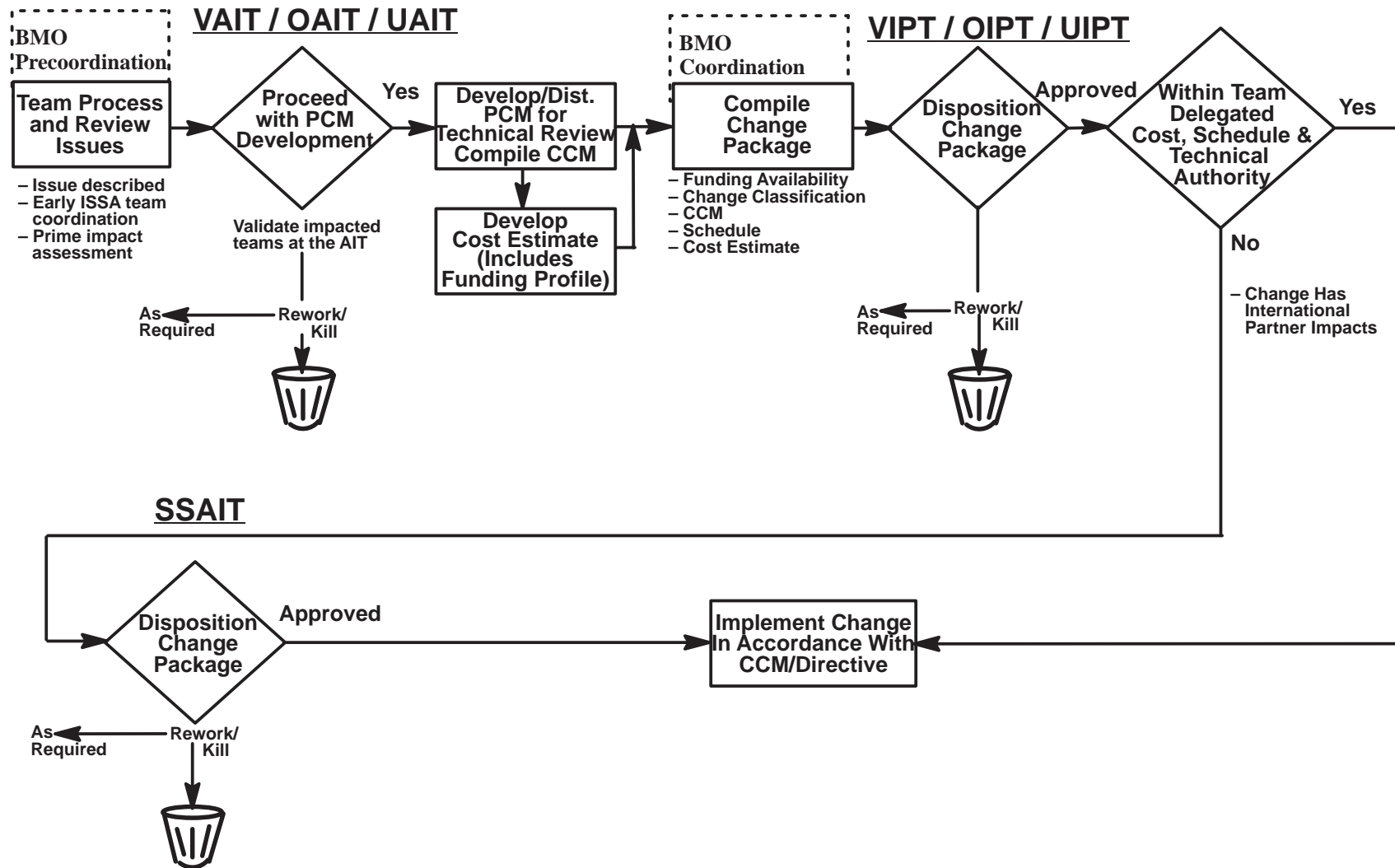**FIGURE H–1.2   INTEGRATED CHANGE PROCESS FLOW, URGENT IMPLEMENTATION WITH CONTRACT ENGINEERING FUNCTION**

VAIT / OAIT / UAIT

VIPT / OIPT / UIPT

BMO
Precoordination

Team Process and Review Issues

– Issue described
– Early ISSA team coordination
– Prime impact assessment

Proceed with PCM Development

Validate impacted teams at the AIT

Yes

As Required ← Rework/Kill

Develop/Dist. PCM for Technical Review Compile CCM

Develop Cost Estimate (Includes Funding Profile)

BMO Coordination

Compile Change Package

– Funding Availability
– Change Classification
– CCM
– Schedule
– Cost Estimate

Disposition Change Package

Approved

As Required ← Rework/Kill

Within Team Delegated Cost, Schedule & Technical Authority

Yes

No

– Change Has International Partner Impacts

SSAIT

Disposition Change Package

Approved

As Required ← Rework/Kill

Implement Change In Accordance With CCM/Directive

FIGURE H−1.3 INTEGRATED CHANGE PROCESS FLOW, NO PRIME IMPACT

H.1.1.2 COORDINATION OF PRELIMINARY CHANGE MEMOS

Contract Engineers will participate in all AIT discussions and board meetings concerning the preparation and approval of urgent PCMs. The Contract Engineer will gather data on technical and financial pros and cons, preliminary evaluations by the sponsoring/lead IPT, cost estimates, change classification, and schedule impacts. The data will be complied by the Contract Engineer for the NASA Configuration Management Manager and the NASA Business Management Manager to provide a Business Management opinion at the VAIT, OAIT, or UAIT. This Business Management opinion is critical since any change approved for CCM development will continue to incur proposal preparation costs but at a higher rate than at the PCM stage since the PCM will be sent out to the Program for evaluation.

H.1.1.3 COORDINATION OF COMPOSITE CHANGE MEMOS

Contract Engineers will participate in all IPT discussions concerning the preparation and approval of CCMs. Contract Engineers will obtain the following data from the Lead IPT and all the affected IPTs so that the Contract Engineer is fully cognizant of the change: change evaluations; pros and cons discussion notes, including resource impacts such as weight, power, and Extravehicular Activity (EVA) time; change classification; ROM costs; schedule impacts; other Program participant change evaluations; and International Partner evaluations.

H.1.2 TECHNICAL EVALUATIONS

Government preliminary Technical Evaluations (TEs) will be conducted in parallel to the contractor's proposal effort. Preliminary TEs will be completed and submitted to NASA Procurement no later than the date of submission of the contractor's proposal. Final TEs will be requested from the NASA Change Engineer immediately following delivery of a proposal and will be submitted to Procurement within two to four weeks following proposal submission, if the proposal contains <u>only</u> data and information previously disclosed to NASA evaluators during advance fact–finding for the Preliminary TE. If the proposal contains technical information or labor estimates that were not previously disclosed to NASA evaluators, then the Final TE will be due to Procurement within six weeks following proposal submission.

H.1.2.1 PRELIMINARY TECHNICAL EVALUATIONS

Upon approval of a PCM, the Contract Engineer will prepare requests for Preliminary TEs. Two types of requests will be required. The two types of Requests for Preliminary TEs are Primary and Supporting Requests. These two types are described in the following paragraphs. All requests for TEs will be signed by the CM Lead Contract Engineer.

H.1.2.1.1 PRIMARY PRELIMINARY TECHNICAL EVALUATIONS

A Request for a Primary Preliminary TE will be prepared by the NASA Contract Engineer and sent to the NASA OPR, who is a member of the Lead IPT. Requests for Primary Preliminary

TEs will be prepared by NASA Contract Engineers and signed by the Lead NASA Contract Engineer. These requests will be submitted to the NASA OPR on the Lead IPT within one week following approval of a PCM. The Lead IPT is the IPT which sponsored the change and in most cases would be the IPT most affected by the change. The primary request will notify the NASA OPR of his/her responsibility to provide an Integrated Preliminary TE, which addresses the impacts, concerns, and evaluations from the Lead IPT and all affected IPTs. In addition, the primary request will describe the following: the items that should be addressed in the evaluation; the format for the TE; and the required due date for the TE (should be after CCM approval but before proposal submission). A completed Primary Preliminary TE should be forwarded from CM to Procurement no later than the date of proposal submission. See Figure H–2 "Request for Primary Preliminary Technical Evaluation" for a standard template.

H.1.2.1.1.1 CONTRACT ENGINEER SUPPORT FOR COMPILATION OF PRIMARY PRELIMINARY TECHNICAL EVALUATION

NASA Contract Engineers will provide support to the NASA OPR on the Lead IPT to compile all the affected IPT evaluations and the Lead IPT evaluation into one integrated TE. NASA Contract Engineers will retain a file copy of the Request for Primary Preliminary TE and file copies of all Requests for Supporting Preliminary TEs. A copy of the completed integrated Preliminary TE will be forwarded to the NASA Contracting Officer.

H.1.2.1.2 SUPPORTING PRELIMINARY TECHNICAL EVALUATIONS

Requests for Supporting Preliminary TEs will be prepared by NASA Contract Engineers and sent to the NASA OPRs on all the affected IPTs. Requests for Supporting Preliminary TEs will be prepared concurrently with the primary request. Requests for Supporting Preliminary TEs will be co–signed by the CM Lead Contract Engineer and the NASA OPR on the Lead IPT. The NASA OPR on the Lead IPT will distribute Requests for Supporting TEs to the affected IPTs. The Requests for Supporting TEs will notify the NASA OPR of his/her responsibility to provide a Preliminary TE, which addresses the impacts, concerns, and evaluations from his/her IPT. In addition, the Supporting Request will describe: the items that should be addressed in the evaluations; the format for the TEs; the required due date for the TEs (should be due approximately two weeks prior to CCM approval); and a statement that the supporting TE should be submitted to the NASA OPR on the lead IPT. See Figure H–3 "Request for Supporting Preliminary Technical Evaluation" for a standard template.

H.1.2.2 FINAL TECHNICAL EVALUATION

The NASA Contract Engineer will request a Final TE, from the NASA OPR on the Lead IPT, the same day that the ECP is submitted. The request for Final TE is a form letter that references the accomplishment of the Preliminary TE. See Figure H–4 "Request for Final Technical

MEMO

TO: ORG. CODE/(NASA OPR ON LEAD IPT)

FROM: OG5/SSPO CONFIGURATION MANAGEMENT OFFICE

SUBJECT: REQUEST FOR PRIMARY PRELIMINARY TECHNICAL EVALUATION (TE)

You have been identified as the OPR for Preliminary Change Memo (PCM) #, _____ TITLE_____ _____. As OPR you are required to prepare a preliminary TE, which will be used to establish the government's negotiation positions. Your preliminary TE should be developed concurrent with the development of change evaluations for the Composite Change Memo (CCM) and is due to the undersigned upon approval of the CCM. In order for you to complete a fully integrated TE covering all affected IPTs you will need to obtain supporting preliminary TEs from the NASA OPRs assigned to those IPTs.   CEs NAME   will be available to assist in the compilation of the supporting TEs. Enclosed with this request, you will find _#_ Requests for Supporting Preliminary TEs. The Requests for Supporting Preliminary TEs have been signed by Configuration Management but must also be signed by you and distributed immediately.

Your TE should contain a few introductory paragraphs which briefly discuss the Technical Merit of the change. Items that are to be addressed include:

1.   Value to the Government

2.   Ability to meet Program objectives

3.   Understanding of the Scope of Work

The body of your TE should address the following:

1.   Groundrules & Assumption

2.   Language Changes to the SOW, DRDs, or Applicable Documents

3.   Recommended Direct Labor Hour Impacts from IPTs

4.   Recommended Material costs from IPTs

5.   Recommended Subcontract costs

It is our understanding that the IPT developed inputs (change evaluations) will feed directly into an Engineering Change Proposal (ECP). Your Boeing counterpart will be preparing task sheets which identify impacts by man–months or labor hours. Therefore, during the change evaluation process, you are encouraged to discuss your (the NASA) evaluation/position of the recommended impacts that the IPT is developing, and try to get the team to accept your position, or understand the contractor position. However, you should not argue with contractor members of the IPT.

Your TE should describe the IPTs recommendations and your objective and maximum positions. The objective position is what you truly think it would take to complete the job. The maximum position is a backoff position for some areas that you are not certain about and feel that the contractor may be able to provide solid rationale to substantiate all or part of their position. Your positions with respect to direct labor hours, material costs, and subcontract dollars should be provided by Government Fiscal Year (GFY).

Arbitrary reductions are not acceptable. The TE must explain why a reduction is justified and include the rationale for all recommendations. Your TE must also provide rationale for acceptance of the IPT recommendations. If budget limitations require a reduction in scope of effort, the TE must specify where effort can be adjusted and discuss any impact to the program.

Again,   CEs Name   has been assigned to work with you to compile all the supporting TEs into one integrated product. Please contact this person whenever you have any questions and don't hesitate to accept and use our assistance. Your TE is due to   CEs Name   by Estimated Date of CCM approval .

Richard D. Delgado

Enclosures

FIGURE H–2 REQUEST FOR PRIMARY PRELIMINARY TECHNICAL EVALUATION

MEMO

TO: ORG. CODE/(NASA OPR ON AFFECTED IPT)

FROM: OG5/SSPO CONFIGURATION MANAGEMENT OFFICE &
                  ORG. CODE/(NASA OPR ON LEAD IPT)

SUBJECT: REQUEST FOR SUPPORTING PRELIMINARY TECHNICAL EVALUATION (TE)

You have been identified as the OPR for the _____IPT, which is affected by Preliminary Change Memo (PCM) #, _____TITLE_____. As an OPR of an affected IPT, you are requested to prepare a supporting preliminary TE, which will be compiled with other supporting preliminary TEs and used to establish the government's negotiation positions. Your supporting preliminary TE should be developed concurrent with the development of change evaluations for the Composite Change Memo (CCM) and is due to the NASA OPR on the Lead IPT upon completion of your IPTs evaluation of the PCM.

Your TE should contain a few introductory paragraphs which briefly discuss the Technical Merit of the change. Items that are to be addressed include:

1. Value to the Government
2. Ability to meet Program objectives
3. Understanding of the Scope of Work

The body of your TE should address the following:

1. Groundrules & Assumption
2. Language Changes to the SOW, DRDs, or Applicable Documents
3. Recommended Direct Labor Hour Impacts from IPTs
4. Recommended Material costs from IPTs
5. Recommended Subcontract costs

It is our understanding that the IPT developed inputs (change evaluations) will feed directly into an Engineering Change Proposal (ECP). Your Boeing counterpart will be preparing task sheets which identify impacts by man–months or labor hours. Therefore, during the change evaluation process, you are encouraged to discuss your (the NASA) evaluation/position, of the recommended impacts, that the IPT is developing, and try to get the team to accept your position, or understand the contractor position. However, you should not argue with contractor members of the IPT.

Your TE should describe the IPTs recommendations, your objective, and maximum positions. The objective position is what you truly think it would take to complete the job. The maximum position is a backoff position for some areas that you are not certain about and you feel the contractor may be able to provide adequate rationale to substantiate all or part of their position. Your positions, with respect to hours and materials, should be provided by Government Fiscal Year (GFY).

Arbitrary reductions are not acceptable. The TE must explain why a reduction is justified and include the rationale for all recommendations. Your TE must also provide rationale for acceptance of the IPT recommendations. If budget limitations require a reduction in scope of effort, the TE must specify where effort can be adjusted and discuss any impact to the program.

CEs_Name_ from the configuration management office has been assigned to work with you, if you have any questions about the TE format or need preparation assistance, please contact this person and don't hesitate to use his/her assistance. Your TE is due to _NASA OPRs Name_ by _date which is approximately 2 weeks prior to CCM approval_.

Richard D. Delgado   NASA OPR on Lead IPT
Configuration Management   Organization

FIGURE H–3 REQUEST FOR SUPPORTING PRELIMINARY TECHNICAL EVALUATION

MEMO

TO: ORG. CODE/(NASA OPR ON LEAD IPT)

FROM: OG5/SSPO CONFIGURATION MANAGEMENT OFFICE

SUBJECT: REQUEST FOR FINAL TECHNICAL EVALUATION (TE)

Enclosed is a copy of Engineering Change Proposal __#__ , _____TITLE_____ . You submitted a Preliminary TE against the Change Package that this proposal is based on. You are required to review the ECP, check off the block below that applies and provide additional evaluations as needed to complete the evaluation of this proposal.

_____   The ECP has been reviewed. It is completely in line with the change package data that was evaluated during the change process. No further factfinding or evaluation is necessary. The preliminary TE should be used as the Final Evaluation.

_____   The ECP has been reviewed. It contains some minor deviations from the change package data that was evaluated during the change process. The attached supplemental TE should be combined with the preliminary TE to form the Final Evaluation.

_____   The ECP has been reviewed. It contains major disconnects from the change package data that was evaluated during the change process. The ECP will need to be reviewed by the NASA OPRs on all the affected IPTs. Extensive revisions to the preliminary TE will be required to complete the Final Evaluation. Fact–finding questions will be forwarded to your office within one week.

If you have any questions, please contact your Contract Engineer, _____NAME_____ at extension _____.

Richard D. Delgado

Technical Evaluator: _____   _____
                                                                Date

Configuration Management Approval: _____   _____
                                Arthur C. Bond, Jr., Manager   Date

FIGURE H–4 REQUEST FOR FINAL TECHNICAL EVALUATION

Evaluation" for a standard template. The NASA OPR on the lead IPT will check one of three response lines that best describe the review of the proposal. The NASA OPR will sign as the Technical Evaluator on the Final TE form.

The first response line will only be checked if the ECP is **COMPLETELY** in line with the change package data that was evaluated during the change process. If this is true, no further evaluation will be necessary and the Preliminary TE will be used as the Final evaluation. The completed Final TE form is due to CM within <u>one week</u> from the date of request for the Final TE.

The second response line will only be checked if the ECP closely reflects the change package data that was reviewed during the change process. If the ECP contains minor deviations from the change package data, then only those deviations will be evaluated. Minor deviations are categorized as those deviations which the NASA Evaluator can address without entering into fact–finding/clarification discussions with the Prime Contractor or PG. A Supplemental TE covering the minor deviations will be combined with the Preliminary TE to form the Final Evaluation. The completed Final TE form is due to CM within <u>three weeks</u> from the date of request for the Final TE. The NASA Contract Engineer will review the Final TE making adjustments and clarifications as necessary. The Final TE will be reviewed by the Lead NASA Contract Engineer, concurred on by the NASA Configuration Management Manager, and approved by the NASA Business Management Manager. The completed Final TE is due to NASA Procurement <u>six weeks</u> following submission of the ECP.

The third response line will only be checked if the ECP contains major disconnects from the change package data that was reviewed during the change process. If extensive discrepancies are found, the ECP will need to be reviewed by all NASA OPRs on affected IPTs. Additional fact–finding may be required. Any fact–finding questions will be due to NASA CM within one week from the request for Final TE. The final TE may have to be written from scratch, using the preliminary TE as a guide. The completed final TE is due to CM within <u>four weeks</u> from submission of the ECP. The NASA CE will review the final TE making adjustments and clarifications as necessary. The final TE will be reviewed by the Lead NASA CE, concurred on by the NASA Configuration Management Manager, and approved by the NASA Business Management Manager. The completed Final TE is due to NASA Procurement <u>six weeks</u> following submission of the ECP. The detailed process of performing and completing technical evaluations is described in SSP TBD, ISS Technical Evaluation Handbook.

H.2 ENGINEERING TECHNICAL COMPLIANCE

Engineering Technical Compliance personnel perform the following functions:

H.2.1 PROPOSAL SUPPORT

Engineering Technical Compliance proposal support consists of the following elements:

a. RFP Analysis – Review the complete draft/released RFP, and amendments thereto, to ensure that all requirements applicable to Engineering (and to a limited extent – other functions) are identified for consideration in the proposal response. Identify vague, nonspecific wording and provide recommended wording to eliminate redundancy and inconsistency within the RFP in order to enable valid proposal estimating.

b. Requirements tailoring – Be cognizant of potential requirements tailoring as the result of performing RFP analysis tasks. Recommendations for tailoring will be provided to the responsible IPT/AIT for consideration as part of the proposal response process.

c. SOW Accomplishment Criteria – Define what is to be accomplished that will provide completion evidence for each SOW task. Identify specific effort necessary to complete the task. This will provide SOW accomplishment criteria to support the basis for proposal task estimate and define required evidence of task completion to support development of the Task Completion Record.

d. Subcontractor Documentation Critique – Critique the SOW and procurement specification/source control drawing for each subcontract to ensure that applicable requirements flow down.

e. Fact–Finding/Negotiation Support – Verify that the proposal remains responsive to technical requirements/criteria stated in the RFP. Propose changes that reflect changes agreed to during fact–finding. Maintain data reflecting the results of negotiation and ensure that the definitized contract reflects same.

H.2.2 TECHNICAL EVALUATION AND SCOPE ASSESSMENTS

Review the complete contract and work authorization to identify all requirements applicable to Engineering and their engineering direct support organizations. Maintain in–depth knowledge of contract technical requirements in order to accomplish the following subparagraphs.

H.2.2.1 TECHNICAL REQUIREMENTS CLARIFICATION/INTERPRETATION

Serve as the focal point for all coordination within Engineering and between IPT/AITs and Contracts/Customer for clarification/interpretation of technical requirements. As the focal point, Technical Compliance will do the following:

a. Respond to contractual questions generated by IPTs/AIT

b. Develop and present to program management, position papers on customer initiated inquiries and concerns

c. Prepare correspondence to address technical and administrative issues

d. Assist Procurement in the negotiation of solutions with customer

H.2.2.2 DESIGN REVIEW/CONFIGURATION AUDIT COMPLIANCE ANALYSIS

Engineering Technical Compliance support to design reviews/configuration audits activities are as follows:

a. Participate in the planning for, and conduct of, design reviews and configuration audits to ensure that contract requirements are addressed

b. Complete analysis of review/audit data to ensure that it meets contract requirements

H.2.2.3 TECHNICAL MEETING SUPPORT

Participate in meetings, as requested, to ensure agreements reached are in accordance with prime contract requirements or identified as requiring separate contractual authorization to implement. Provide program technical meetings with status on technical compliance issues.

H.2.2.4 CHANGE CLASSIFICATION ASSESSMENT

Change Classification Assessments determine if actions requested by engineering documentation or contract correspondence is within the scope of the contract being worked.

Engineering Technical Compliance will perform change classification assessments by the following:

a. Reviewing customer and internally initiated change requests/correspondence to determine in–scope/out–of–scope classification

b. Conducting continuous review of all Engineering documentation (specifications, meeting minutes, etc.) to monitor Engineering performance against technical contract obligation

c. Reviewing subcontract procurement data (e.g., SOW, procurement specifications) for compliance with the prime contract requirements

A Change Classification Assessment form will be used by Technical Compliance to document the Change Classification determination required by the Prime Contract. It will become a part of the file assembled by the Change Integrator for each proposed change. This form may also be used to document Technical Compliance assessment of other non–change data such as Contracting Officer Letters, Design Review Issues, technical inquiries, etc.

The Change Classification Assessment form is included in this Appendix as Attachment A. The various sections of the form are defined with the form.

H.2.3 CONTRACT CHANGE, DEVIATION, AND WAIVER SUPPORT

Engineering Technical Compliance support to change proposals will consist of the following subparagraphs:

H.2.3.1 CONTRACT LANGUAGE MAINTENANCE

Analyze change documentation and review contract language changes that are required to incorporate the effects of the change. This includes all changes to the contract schedule, clauses, SOW, Data Requirements List (DRL), and other elements of the contract.

a. Review proposed changes to determine if SOW modification is required

b. Review all other contract elements to assess if additions, deletions or modifications to existing elements must be changed

c. Review recommended contract language changes

d. Review changes to contract language as necessary due to fact–finding and negotiation

e. Review Supplemental Agreements for proper incorporation of contract language

H.2.3.2 CONTRACT SPECIFICATION MAINTENANCE

Specification maintenance pertains to keeping the specification up–to–date by SCN and specification change pages or specification revision. Engineering Technical Compliance will support specification maintenance as follows:

a. Review of proposed contract changes to determine if contract specifications require changes

b. Provide support to responsible AIT/IPT in developing necessary specification changes

c. Review specification change package prior to inclusion in the proposal to the customer

H.2.3.3 FACT–FINDING/NEGOTIATION SUPPORT

Engineering Technical Compliance will provide the following to support fact–finding and negotiation.

a. Review change proposals prior to submittal to contracts to do the following:

   (1) Verify, for proposals responding to customer direction, that the proposal is responsive to customer requirements

   (2) Assure that Engineering task coverage is complete and there is no redundancy of task performance

b. Provide and/or support Engineering representation at fact–finding and negotiation

c. Provide complete and timely answers to questions concerning Technical Compliance functions arising from fact–finding/negotiation and document answers for contract's record of negotiation

H.2.3.4 CONTRACT MODIFICATION/WORK AUTHORIZATION REVIEW

Engineering Technical Compliance will provide the following in support of Work Authorization release:

a. Review customer Change Orders, or equivalent, to ensure technical compatibility with submitted change proposal. Provide required, coordinated changes to Contracts.

b. Review customer draft Supplemental Agreement, or equivalent, to ensure technical compatibility with negotiated settlement. Take appropriate actions required to ensure compatibility.

H.2.3.5 DEVIATION AND WAIVER SUPPORT

Engineering Technical Compliance will perform the following in support of Deviation and Waiver processing:

a. Verify the need for deviation/waivers based on contract requirements

b. Review the completed DD Form 1694 for compliance with MIL–STD–480, Configuration Control – Engineering Changes, Deviations and Waivers preparation requirements

c. Coordinate with responsible AIT/IPTs to ensure that the DD Form 1694 is completed correctly with adequate technical description and supporting rationale

d. Assess the deviation or waiver for appropriate classification – deviation or waiver, and identify as minor, major, or critical based on the requirements of MIL–STD–480

e. Assist Contracts in developing the basis for consideration (i.e., monetary or otherwise) and the rationale to support either a no consideration or the proposed amount of consideration

f. Coordinate with customer as necessary to expedite responses

g   Prepare and/or update deviation/waiver guidelines to be used by program personnel

h. Maintain a file of deviations/waivers with supporting documentation

i. Provide deviation/waiver data for configuration audit support and hardware/software deliveries

H.2.4 CONTRACT DELIVERY AND CLOSURE SUPPORT

Engineering Technical Compliance will perform the following subparagraphs in support of contract deliveries and closure.

H.2.4.1 TASK COMPLETION RECORD

Task compliance/completion documentation will be developed and released for the contract. The documentation is used in support of contract closeout and to verify task completion. Task completion effort will consist of the following:

a. Identifying all contractually required technical tasks

b. Analyzing each task and identifying what is required to evidence completion

c. Identifying the prime organization responsible for performing each task and providing closure evidence

d. Review evidence of closure provided and assess its adequacy

e. Resolve inadequate inputs to resolution

f. Provide traceability to closure evidence

H.2.4.2 TASK COMPLETION STATUS

Maintain status of task completion and provide visibility of actual versus scheduled completion.

H.2.4.3 DELIVERY SUPPORT

Configuration Status Accounting will provide deviation/waiver status documentation for inclusion in the delivery package.

H.2.5 CONDUCT OF COMPLIANCE AUDITS

The following tasks will be accomplished by Engineering Technical compliance in conduct of compliance audits:

a. Serve as the focal point for general planning and conduct of subcontractor CM compliance audits

b. Develop and maintain a subcontractor CM compliance audit plan, which will include as a minimum the following:

   (1) Criteria for identifying subcontractors who require an audit

   (2) Subcontractor compliance audit schedule

   (3) Subcontractor requirements to be audited

c. Ensure subcontract(s) includes provisions for periodic compliance audits at the subcontractor's facility

d. Conduct audits and document results

e. Summarize audit findings and recommendations in an audit report to Materiel

f. Monitor subcontractor corrective action for successful implementation

Note: Corrective action may be monitored through follow–up audits or reports submitted by the subcontractor.

ATTACHMENT A TO APPENDIX H
CHANGE CLASSIFICATION ASSESSMENT FORMS AND PREPARATION INSTRUCTIONS

Instructions for the preparation of the Change Classification Assessment form.

Use the following instructions to complete the form:

<u>TC</u> – This is a tracking number assigned by Technical Compliance. Revisions will be indicated as "R1", "R2", etc.

<u>INITIAL / FINAL</u>

— An <u>"Initial"</u> rating is given to an Assessment when a draft piece of change paper is reviewed, or when the change paper is not sufficiently comprehensive to allow a complete Assessment. Assessments made of non–change data will be rated as "initial". An "Initial" review is required prior to presentation of Draft Program Change Memos (PCMs) to the Vehicle Analysis and Integration Team (VAIT).

— A <u>"Final"</u> rating will be applied to a change when there is sufficient information upon which to make a complete Assessment. A "final" Assessment is required to be completed before the Change Package (Composite Change Memo (CCM)) is presented to the Vehicle Integrated Product Team (VIPT) for disposition.

<u>ISSUE and DOCUMENT REFERENCE;</u>

— The "Issue" entry is a verbatim copy of the <u>title</u> or <u>subject</u> of the change, taken directly from the document being assessed.

— The "Document Reference" contains the number(s) of the document(s) being reviewed (e.g., the DDP, PCM, TCIF, etc., number). If an un–numbered change is assessed, this information will be noted.

<u>BACKGROUND INFORMATION</u> – This section contains descriptive information on the change, to provide the reader with a feel for what the change is, and why it is being proposed. Different versions of the Assessment (Initial to Final) will update/expand this section as additional information becomes available.

<u>AFFECT OF THIS CHANGE</u> – This section contains the appropriate NASA and/or Prime–controlled documents that are indicated to be affected by the change. Technical Compliance will identify any additional Station documents that may be impacted by the change. Additional non–prime impacts (e.g., Shuttle, International Partners, etc.) will also be indicated. Initial Assessments will be based on affected documentation indicated in the Preliminary Change Memo (PCM), (including paragraph/section numbers affected). Final Assessments will be based on review of the specific "from to" language contained in the Composite Change Memo (CCM).

<u>CLASSIFICATION OF CHANGE</u> –

— ECP/PCP/TCP – Technical Compliance determination of the type of change proposal that will be required to process the change.

  — ECP – A Class I change which affects specific Configuration Items (CIs)/Computer Software CIs (CSCIs)

- — PCP – A Class I change which does not affect CIs/CSCIs
- — TCP – A Class II change affecting the Product Groups (PGs) contracts

— N/A – Indicates no formal change action required by NASA and/or the Prime.

— Swing Clause Eligibility – Technical Compliance will determine if the change falls within the technical criteria of Prime Contract clause H.21. Special Provision H.21 (Swing Clause) may apply only if subsequent estimates are less than $500K.

— Basis of Change – Technical Compliance assessment of the reason for the change.

- — Cost Savings/Reduction – Indicates a change proposed to save/reduce total program costs, or to resolve funding limitations.
- — Make Operable – Indicates a change required to correct an operational or design deficiency as related to the current Program baseline.
- — Enhancement – Indicates a "make better" condition. A change which improves program/system performance, is not required to correct an operational/design deficiency, and does not represent a cost reduction/savings.

— Recommended Justification Code – Technical Compliance recommended justification code (as defined in DOD–STD–480A, Para. 4.3.2). This code is used by the Change Integrators.

<u>PRIME CONTRACTUAL SCOPE</u> – Technical Compliance assessment of whether a change is above and beyond current Prime Contract requirements. The "rationale" section provides the explanation of this assignment.

All Assessments will be approved by the CMAIT Technical Compliance Team, Boeing and NASA Co–Leaders.

Technical Compliance will keep a record and file of all Assessments, along with pertinent additional information that is used to make the various judgments reflected on the subject form.

TC_____

INITIAL _____   FINAL _____
CHANGE CLASSIFICATION ASSESSMENT
TECHNICAL CONTRACT COMPLIANCE

ISSUE and DOCUMENT REFERENCE:

•

BACKGROUND INFORMATION

•

AFFECT OF THIS CHANGE

NASA–Controlled Documents affected:

•

Prime–Controlled Documents affected:

•

CLASSIFICATION OF CHANGE   Class I ___   Class II ___

Change Type   (ECP ___)   (PCP ___)   (TCP ___)   (N/A ___)
Swing Clause Eligibility: YES ___   NO ___
Basis of Change: (Cost Savings/Reduction ___) (Make Operable ___) (Enhancement ___)
Recommended Justification Code: (A___) (B___) (C___) (D___) (O___) (P___) (R___) (S___) (V___)

PRIME CONTRACTUAL SCOPE

Exceeds Minimum Current Contract Requirements: Yes ____   No ____
Rationale:

Prepared by _____ Date _____
Co–Lead Concurrence _____ Date _____
Co–Lead Concurrence _____ Date _____

(This page reserved)

APPENDIX I REVIEWS AND AUDITS

TABLE OF CONTENTS

I.1 REVIEWS AND AUDITS

Technical reviews and audits will be conducted as a series of formal meetings during the design and development phases of the ISSA Program. Program organizations, will participate in these meetings/control boards to critically examine the systems engineering (both design and test) efforts to ensure a controlled evolution of CIs and CSCIs from conception through production.

All design and other reviews, audits and product certifications will be performed in a standardized manner using MIL–STD–1521, Technical Reviews and Audits for Systems, Equipment and Computer Software as a guide. These reviews and audits will also define the incremental baselines and configuration identifications applicable to each CI and CSCI.

I.1.1 DESIGN REVIEWS

I.1.1.1 PRELIMINARY DESIGN REVIEW (PDR)

A PDR will be conducted on each CI or group of CIs, in accordance with the requirements established by contract, prior to initiation of detail design effort or when it is most efficient to do so. The purpose of the PDR will be the following:

a. Determine the adequacy of the Development Specification to define the requirements for its CI and to satisfy the requirements of the system specification.

b. Evaluate the technical adequacy of the selected design approach.

c. Evaluate the adequacy and compatibility of the interface requirements between that CI and other Boeing CIs included in the system specification.

d. Evaluate the technical adequacy of the planned approach to testing, maintenance, support equipment, training equipment, etc.

I.1.1.1.1 PRELIMINARY DESIGN REVIEW CONSIDERATIONS

To satisfy the requirements of a PDR, the following criteria will be considered applicable.

I.1.1.1.1.1 General Criteria:

a. Compliance of the identified configuration with the system requirements and specifications

b. Interface requirements

c. Compliance with contract documentation requirements

d. Anticipated development schedule

e. Reliability

f. Maintainability

g. Survivability/Vulnerability

h. Human factors

i. Facilities

j. Producability considerations

k. Handling and shipping restrictions

l. Critical components

m. Test requirements and plans

n. GFE and GFP

I.1.1.1.1.2 Electrical/Electronic Criteria:

a. Circuit and logic diagrams

b. Electrical characteristics including power inputs, outputs, and tolerances

c. Electromagnetic interference

d. Packaging

I.1.1.1.1.3 Mechanical Criteria:

a. Preliminary stress analysis

b. Preliminary dynamic load analysis

c. Preliminary static load analysis

d. Shock and vibration spectrum to be generated or to which item will be subjected

e. Installation considerations

I.1.1.1.1.4 Software/Firmware Criteria:

a. Micro program logic diagrams

b. Developmental and test support software

c. Computer program function flow

d. Control function descriptions

e. Program structure

f. Interfaces, inter and intra system

g. Unique security requirements

I.1.1.1.2 FUNCTIONAL DESCRIPTIONS

The responsible design team will designate the Chairman of the PDR, and the design team will provide review data which will include such items as the following:

a. Design Description

    (1)   Description summary

    (2)   Hardware/software CI Development Specification

    (3)   Design approach layouts

    (4)   Layouts showing interfaces

    (5)   Mockups

b. Technical background data

    (1)   Definition phase systems engineering data

    (2)   Logistics support data

    (3)   Development schedules

    (4)   Technical analysis and trade studies

    (5)   Test planning

    (6)   Process specifications

    (7)   Product assurance requirements

c. Long–lead procurement which must be authorized so that procurement can be initiated in order to support fabrication schedules

The PDR chairman will do the following:

a. Ensure that a data package is compiled to support the PDR and obtain approval of the proposed agenda.

> Note: Review of a supplier item may require attendance of the supplier. Such reviews may be conducted at the supplier's facility. Materiel will coordinate supplier reviews with the supplier and affected functional participants.

b. Be responsible for the coordination of facilities including conference rooms, telephone service, clerical support, reproduction support, and notification of affected responsible teams to provide support and attendees.

c. Appoint a recorder to document the activities of each PDR as formal minutes. These minutes will record the following:

    (1)   All persons officially participating in the review

    (2)   All significant data reviewed

    (3)   All significant comments and the decisions reached during the review

    (4)   All action items affecting specifications

d. Following PDR, obtain the signature of all officially participating attendees (These signatures constitute approval of the minutes as written, and do not signify contractual approval of the review.)

e. Following customer approval, forward PDR minutes to affected responsible teams for initiation of corrective actions required.

I.1.1.2 CRITICAL DESIGN REVIEW

A CDR will be conducted for each CI prior to initiation of fabrication or procurement (except for specific long–lead items). The purpose of the CDR is to do the following:

a. Identify the specific engineering drawings, documents, and associated lists required for fabrication and procurement.

b. Determine the adequacy of the detail design to satisfy the design requirements of the CI development specification, including interface requirements both internal and external.

c. Determine the adequacy of test requirements/procedures documentation to satisfy the requirements of the CI specification.

d. Determine the adequacy of related maintenance/support equipment, training equipment, operating and maintenance manuals, spares, etc., or the planning therefore to support the CI.

CDRs may be conducted progressively, especially on complex systems.

I.1.1.2.1 CRITICAL DESIGN REVIEW CONSIDERATIONS

To satisfy the requirements of a CDR, the following criteria shall be considered applicable.

I.1.1.2.1.1 General Criteria:

a. Compliance with specific design and interface requirements and other direction as applicable. This includes system requirements and specifications, customer standards and specifications, recognized engineering standards, and other contractual publications.

b. Anticipated development schedule for qualification testing of the item

c. Reliability

d. Maintainability

e. System Safety

f. Human engineering

g. Facilities

h. Environmental requirements

i. Producability

j. Inspectability with consideration of visual, mechanical, radiological, and ultrasonic techniques

k. Handling restrictions

l. Process specifications, with emphasis in areas representing usual or state–of–the–art advances in processing techniques

m. Critical Item specifications

n. Test plan

o. Inspection and quality control requirements

p. GFE or GFP

I.1.1.2.1.2 Electrical/Electronic Criteria:

a. Circuit logic analysis by block diagrams

b. Electrical characteristics including power inputs, outputs, and tolerances

c. Functional interface requirements

d. Characteristics of thermal environment, radiation, vibration/shock, and electromagnetic
    interference

e. Packaging

f. Test equipment (support and self–test capability)

g. Parts selection (standard and deviations)

I.1.1.2.1.3 Mechanical Criteria:

a. Detailed stress analysis

b. Detailed static loads analysis

c. Detailed dynamic loads analysis

d. Shock and vibration environment to be generated or to which the item will be subjected

e. Installation considerations

f. Detailed weight and balance analysis

I.1.1.2.1.4 Software/Firmware Criteria:

a. Complete Product Computer Program Configuration Item (CPCI) Specification

b. Supporting documentation

c. Interfaces CPCIs to CPCIs and Computer Program Configuration (CPCs) within a CPCI

d. Detailed logic flow diagrams

e. Processing algorithms

f. Circuit diagrams

g. Clock and timing data

h. Memory

i. Micro–instruction list and format

j. Input/output data path width

k. Self–test features

I.1.1.2.2 FUNCTIONAL DESCRIPTIONS

The responsible design team will designate the Chairman of the CDR, and the design team will
provide review data which will include such items as the following:

a. Design Description

   (1) Description summary

   (2) Hardware/software Configuration Item specifications (approved Development and Preliminary Product)

   (3) Layouts and drawings showing detail design

   (4) Interface control drawings and documents

   (5) Mockups

b. Technical background data

   (1) PDR approved minutes and action items

   (2) Engineering analyses

   (3) Structural dynamics

      — Stress and loads

      — Fatigue

      — Weight and balance

   (4) Engineering test results

   (5) Logistics support data

   (6) Development schedules

   (7) Technical analysis and trade studies

   (8) Product assurance requirements

c. Producability data

   (1) Fabrication and facilities

   (2) Inspectability

   (3) Value engineering

   (4) Materials and processes

   (5) Functional tests

   (6) Supplier information

   (7) Standard parts

   (8) GFE and GFP

The CDR chairman will do the following:

a. Ensure that a data package is compiled to support the CDR and obtain approval of the purposed agenda.

   Note: Review of a supplier item may require attendance of the supplier. Such reviews may be conducted at the supplier's facility. Materiel will coordinate supplier reviews with the supplier and affected functional participants.

b. Be responsible for the coordination of facilities, including conference rooms, telephone service, clerical support, reproduction support, and notification of affected responsible teams to provide support and attendees.

c. Appoint a recorder to document the activities of each PDR as formal minutes. These minutes will record the following:

   (1) All persons officially participating in the review

   (2) All significant data reviewed

   (3) All significant comments and the decisions reached during the review

   (4) All action items affecting specifications

d. Following CDR, obtain the signature of all officially participating attendees. (These signatures constitute approval of the minutes as written, and do not signify contractual approval of the review.)

e. Following customer approval, forward CDR minutes to affected responsible teams for initiation of corrective actions required.

I.1.2 CONFIGURATION AUDITS

Configuration audits include selecting the CEI/CI for FCA/PCA, scheduling the FCA/PCA and performing the required tasks using MIL–STD–1521 as a guide. The requirements of this MIL–STD are tailored to the ISSA FCA/PCA as described herein. FCA verifies that development of a CI has been completed satisfactorily, that the item's performance complies with its development specification or equivalent, and all verification methods were in accordance with the specification. PCA identifies the product baseline for production and acceptance of the CI audited. PCA verifies that the as built configuration correlates with the "as–designed" product configuration and that the acceptance test requirements prescribed on the documentation are adequate for acceptance of the production unit. Equally important, it demonstrates that management systems (Quality Assurance (QA), Engineering, Configuration Management, etc.) will accurately control the configuration of subsequent production units. Incremental FCA/PCA will be performed on subcontractor systems and major assemblies to incrementally build up to FCA/PCA of CIs.

I.1.2.1 FUNCTIONAL CONFIGURATION AUDIT

The FCA is a formal examination of qualification test, demonstration, inspection, similarity and analysis data to verify that the actual performance of a CI complies with its Development Specification in the "as designed" configuration. The FCA will also verify that each CI/CSCI has performed as required by its functional and allocated configuration baseline. FCAs will be performed on all program CI/CSCIs.

I.1.2.1.1 FCA SUMMARY

A prerequisite to FCA is a PIDS Part 1 or equivalent section 3, "Performance" and section 4, "Verification" data for each applicable CI/CSCI. Equivalent data includes Envelope Drawing or

Procurement Specifications (section 3 and 4, requirement and verification respectively or B1 or B2 specification). In some instances, PIDs Part 1 will be "baselined" as part of the FCA.

FCA includes, the witnessing or monitoring, as applicable, of formal testing by PG and Prime QA personnel and by PG and Prime Engineering personnel; the incremental availability, submittal and approval or concurrence, as applicable, of qualification and functional test procedures, qualification test reports, analyses and summaries; preparation of a Specification Compliance Matrix; conduct of a First Article Inspection (FAI) for Hardware (H/W) or a baseline configuration audit for (S/W) and tracking of qualification–related changes. This includes testing at subcontractor locations.

FCA for a deliverable CI/CSCI culminates in a meeting Co–chaired by the Prime and PG FCA/PCA chairperson and comprised of joint Prime/PG review panels. At the meeting, satisfactory completion status of the FCA tasks is verified, the test article configuration and change incorporation status are reviewed, status of any waivers or deviations which are applicable to the qual unit(s) is reviewed , a qualification summary report document for each CI (test, analysis, inspection, and demonstration) is reviewed, open items and issues, if any, are documented as action items, and the FCA Certification Sheets signed. Separate certification sheets will be provided for PG/Prime signature and Prime/NASA signature.

I.1.2.1.2 FCA CI/CSCI CONFIGURATION

The CI/CSCI configuration for FCA will be that which is established and released at completion of Qualification Testing (QT) for hardware and Test Readiness Review (TRR) for software as updated by subsequent committed change action.

I.1.2.1.3 QUALIFICATION TEST ARTICLE INSPECTION (QTAI)

In order to establish the qualification configuration baseline, an inspection will be performed by the PGs Quality Assurance to verify that the test article conforms to the applicable documentation for the CI/CSCI. This audit will be scheduled and performed in accordance with PGs QA direction with the results being provided for the FCA.

I.1.2.2 PHYSICAL CONFIGURATION AUDIT

The PCA is the formal examination of the "as built" version of a CI/CSCI and the reconciliation of "as built" documentation and "as designed" documentation in order to establish the product baseline. The PCA shall include an audit of released engineering documentation and quality control records on the first CI/CSCI.

I.1.2.2.1 PCA SUMMARY

PCA involves the development/submittal/approval/concurrence of: the item specification (Part II) equivalent (the equivalent Part II specification is a listing of drawings, documents, and test

procedures required to define the Product Baseline), CSCI Software Product Specifications, and Acceptance Test Procedures; performance of First Article Inspection (H/W) and Baseline Configuration Audits (S/W); the witnessing/monitoring by the PGs/Prime QA of fabrication/testing of designated subassemblies and CI/CSCI end items; the incremental buy–off of inspection and audits; the maintenance of waiver/deviation/change status; the development of CI/CSCI specification compliance matrix; the review of drawing/software part drawing for compatibility with CI/CSCI Product Specifications; and certification of management systems (e.g., Engineering Release, Quality Evaluation, etc.) that such are capable of controlling the configuration of subsequent units.

The PCA for a CI/CSCI culminates in a FCA/PCA meeting Co–chaired by the Prime and PG FCA/PCA chairperson and comprised of joint Prime/PG review panels. At the meeting satisfactory completion status of the PCA tasks is verified, the acceptance test procedure approvals and change incorporation status are reviewed, status of any waivers or deviations is reviewed, Verification Analysis/Inspection Reports are reviewed, problems, if any, are documented as action items, and the PCA Certification Sheets signed.

I.1.2.2.2 PCA CI/CSCI CONFIGURATION

The CI/CSCI configuration for PCA is that which was certified at FCA. If differences exist between the FCA and PCA, PGs must reconcile the differences showing they do not affect performance.

I.1.2.3 PROGRAM AUDIT APPROACH

The ISSA Prime Contractors audit approach is to use existing processes and procedures, to avoid unnecessary duplication and thereby to conduct audits in the most cost effective manner possible. The PGs will conduct the audits and the Prime will participate. Since the audits examine CI/CSCI functional and physical characteristics for a particular unit at a specific point in time, it is equally important to demonstrate that management systems/processes are capable of ensuring that subsequent components will be identical; or if such are not, that the change management system properly dispositions all impacts of a change prior to approved incorporation into the CI/CSCI. To reduce cost, the formal FCA and PCA will typically be conducted "end–to–end" in one meeting to meet Program requirements and minimize cost. The FCA/PCA will be a combination of "in process" and formal reviews. This approach is necessary to reduce program costs. An example of "in process" reviews is the annual CM audits of PGs. These audits will verify that in–place CM and QA management systems process engineering data changes correctly, and in a timely manner. These audits will typically scheduled separately from any formal FCA/PCA activities. These systems also verify that the Prime Contractor is supplying change direction properly and in turn, the Product Groups are generating and processing Subcontractor Change Proposals properly, to achieve configuration control.

The approach is to incrementally examine components, major components, systems and Element Level Equipment during the development cycle of a complex CI culminating in a combined

FCA/PCA on the CI. For software, a series of continuing QA audits is an integral part of both the developmental design effort and system surveillance. The "in–process" documentation resulting from these audits will be used in the FCA and PCA. The Prime will participate, with NASA in attendance, in the consecutive FCA/PCAs on the PG end items using authenticated Prime Item Development Specifications (PIDS). The Prime will co–chair these audits with the PG and will sign wrap–up meeting minutes, certificates of completion, action items, etc. for audits on PG end items. The PGs are expected to perform FCA/PCAs on subcontractor CIs using authenticated specifications or equivalent authenticated Section 3, "Performance" and Section 4, "Verification" data. The flowdown of sections 3 and 4 requirements/verification from the System/Segment specifications to the Product Development Specifications, and in turn to procurement specifications or equivalent in the case of PG subcontractors, will be by "Requirements and Traceability Management" (RTM) computer model. Because this approach uses existing processes and is conducted in a real time environment, NASA and the Prime involvement is necessary beginning with the first FCA/PCAs both at the PG level, and the Prime may elect to participate at the PGs' subcontractor level.

Formal incremental FCA/PCAs will be conducted by the PGs on their subcontractor systems and major assemblies. For non–complex components and piece parts FCA/PCA may be accomplished by PG representatives "on–site" at the subcontractor certifying the "as–built" and PG representatives in the "home" office certifying the "as–designed" configuration.

I.1.2.3.1 COORDINATION

A critical activity in successful FCA/PCAs is a close relationship between NASA, Prime Contractor and PG personnel involved in the process. To foster this relationship, the ISSA CMAIT, as focal point for all FCA/PCA activities, will coordinate an overall FCA/PCA schedule and the FCA/PCA processes in this document with NASA, Prime, and PG personnel to achieve a fully coordinated plan. The NASA representative, the Prime FCA/PCA chairperson shall participate in regular telecons/Technical Interchange Meetings (TIM) in order to keep FCA/PCA responsible personnel fully apprised of on–going activities, problems, etc.

I.1.2.3.2 SCHEDULING

a. Scheduling of QA Software Audits, Subcontractor Formal Qualification Review (SFQR), QTAI, TRR and/or FAI/FCA/PCA and the document releases, reports and key events comprising FCA/PCA will be committed by the Program and maintained by PP&C.

b. Detailed schedules for each CI/CSCI requiring FCA/PCA will be developed, maintained and statused to provide management visibility. The FCA/PCA schedules will be coordinated and jointly developed by the Prime and PGs.

c. An overall schedule and progress of FCA/PCA and related milestones will be maintained by PP&C.

I.1.2.3.3 NOTIFICATION

The Prime CMAIT serving as focal point for all FCA/PCA activities, will receive and distribute to all affected Prime and NASA organizations, notice of an impending FCA/PCA event, 30 calendar days prior to the event. The notice will detail the event, location, date, and duration. In the case of those events which are incremental to an FCA/PCA of deliverable end item NASA representation will be required. In the case of an event where NASA signature is not required (i.e., PGs subcontractor FCA/PCA) NASA may wish to participate as an observer.

I.1.2.3.4 READINESS REVIEWS

PGs will be expected to schedule a Readiness Review 30 calendar days prior to each FCA/PCA meeting to determine readiness to hold the audit. The Prime Contractor FCA/PCA focal point will be notified of the Readiness Review. An FCA/PCA Notice and Status Report will be provided to the Prime FCA/PCA focal point within 10 calendar days following the review. The status report will include assigned action items and the following information:

a. Identification of PG/Subcontractor FCA/PCA Team Members, including

    (1) Team Co–Chairperson(s)

    (2) Engineering/Panel Leader(s)

    (3) QA PCA Co–Chairperson

    (4) CM FCA/PCA Panel Leader

    (5) FCA/PCA Members from appropriate technical discipline (i.e., Engineering Hardware – Design and/or Software Design, Engineering Subcontracts, Support Equipment Design Engineering, Configuration Management, Engineering Software Control, Systems Engineering, Integrated Logistics Support, Hardware Test, Quality Assurance, Materiel, Manufacturing, Program Planning and Control, etc.)

b. Identification of CIs/CSCIs to be audited, including:

    (1) Nomenclature

    (2) Part Number

    (3) Specifications (development)

    (4) Specifications (product)

c. Schedules and Status (scheduled vs. actual) of:

    (1) Readiness Reviews

    (2) Qual Test Reports

    (3) Qual Test Report Prime Approval

    (4) ATP Approval

    (5) Prime CI Specification Part II (or equivalent)/CSCI Product Specs Approved

    (6) Substitute/Non–Standard Parts List

(7)   Non–Standard Parts List Prime Approval

(8)   FCA/PCA Agenda Approval by Prime

(9)   SFQR (Start/Completion dates)

(10) CAR Completion

(11) FAI (Start/Completion dates)

(12) QAA (Start/Completion dates)

(13) FCA/PCA (Start/Completion dates)

I.1.2.3.5 AGENDA

A formal agenda will be prepared and formally submitted to the Prime in accordance with the contract requirements by the PGs prior to each scheduled FCA/PCA meeting to be conducted on a deliverable end item. The Prime FCA/PCA focal point will review the agenda, schedule, and plans with the PGs FCA/PCA Chairman and request changes as required.

For items supplied by a PGs subcontractor, a copy of the agenda will be provided to the Prime FCA/PCA focal point for information and distribution within the Prime and NASA.

I.1.2.3.6 DATA SUBMITTALS

Contractually required data will be submitted and approved in accordance with the contract requirements prior to the scheduled PCA. A separate and unique FCA/PCA data package will not be required. The data required for the FCA/PCA meeting will be made available at the meeting.

Formal test plans and reports will be prepared by the PGs and submitted to the Prime in accordance with contract data requirement. Other verification data will be made available via the Data Accession List. Some of the most Commonly used documents which will be made available at the FCA meeting are discussed in the following subparagraphs.

I.1.2.3.6.1 DETAILED VERIFICATION REQUIREMENTS DOCUMENTS

A Detailed Verification Requirements Document will be prepared for each Deliverable End Item. The document will include the detailed verification objectives for the end–item verification activities for qualification and acceptance as defined by contract data requirements. Functional and environmental test and checkout requirements will be included.

I.1.2.3.6.2 VERIFICATION CLOSURE DOCUMENTATION

Verification Closure Documentation will be prepared for each CI/CSCI. These documents record qualification verification status by reference as the verification data becomes available.

Traceability of CI/CSCI configuration evolution (i.e., changes in part numbers) will be addressed in the Closure Documentation and the basis of qualification of subsequent configurations (similarity, analysis, etc.) will be identified. The Verification Closure Documentation will be updated periodically and provided to the Prime Contractor in accordance with contract data requirements.

I.1.2.3.6.3 SPECIFICATION COMPLIANCE MATRIX

Each PG will generate a Specification Compliance Matrix for each CI/CSCI in support of FCA. For each requirement specified in the PIDs section 3 Performance Requirements, the matrix will document evidence of compliance which includes section 4. In the case of subcontractor items, a Compliance Matrix oriented to the "equivalent section 3, Performance, and section 4, Verification data" may be provided by the subcontractor to develop the overall CI/CSCI compliance matrix.

I.1.2.3.6.4 VERIFICATION ANALYSIS/INSPECTION REPORTS

A Verification Analysis/Inspection Report will be prepared for each CI/CSCI for which qualification testing is required. For a CSCI the Software Test Report normally serves as the Verification Analysis/Inspection Report. Technical concurrence by the Prime representative is required for FCA.

I.1.2.3.7 DATA REVIEW

The review will include the following:

a. For CIs, the item specification (Part II) equivalent, Engineering drawings, and Manufacturing records shall be examined for accuracy, completeness, and compatibility. This data will also be reviewed to ensure that they reflect the latest released information.

b. For CSCIs, the design documents, flow charts/program design language statements, and listings in the CSCI Product Specification will be reviewed for accuracy, completeness, and compatibility. The correlation to the deliverable end item (executable load) is accomplished by the QA S/W Baseline Configuration Audit.

c. The engineering release, planning system records, Quality Assurance and change control system documentation will be reviewed to ascertain that they are adequate to properly control the processing and formal release of engineering/manufacturing for CIs and CSCIs. This review will only be a sampling of documentation since the systems have already been validated during the process, development/production activities.

d. Configuration differences between the CI/CSCI qualified and the production hardware/software will be reconciled and be a matter of record in the minutes of the meeting. PGs will certify or demonstrate to the Prime that the differences, if any, do not degrade the functional characteristics of the design.

e. Acceptance test data and procedures will be examined to ensure compliance with the CI accept requirements. For CSCIs, the release system procedures will be audited by QA to verify duplication of copies against the master copy.

f. Review FCA status results.

g. Certification Sheets

I.1.2.3.8 WRAP–UP MEETING

A wrap–up meeting will be held at the completion of the FCA/PCA in accordance with the following:

a. Wrap–up meetings and FCA/PCA on deliverable end items will be co–chaired by the Prime and PG FCA/PCA chairperson.

b. The review panels will provide inputs to the PG chairperson who will conduct the wrap–up meeting and prepare the minutes.

c. The PG and Prime Co–Chairperson will assign action items resulting from review of the related data, procedures, and records.

d. The Prime, PG, and NASA will approve FCA/PCA certification sheets.

e. A complete set of draft minutes will be provided to the Prime Chairperson.

f. The Prime Chairperson will retain the original of each action item.

I.1.2.3.8.1 AUDIT ACTION ITEMS

The Prime and PG audit team will ensure that an appropriate action item is written when warranted by a discrepancy encountered during the audit. Action items are defined as an apparent discrepancy, formally documented by the team, which explains, illustrates, or describes the differences between any documentation and hardware or software, and what is acceptable.

I.1.2.3.8.2 ACTION ITEM LOG

An Action Item Log will be maintained at each FCA/PCA meeting and will be attached to the minutes, with a copy of the Action Items.

I.1.2.3.8.3 TERMINATION OF MEETING

Official termination of the FCA/PCA meeting occurs upon mutual execution of the certification sheets and action items by the PG and Prime.

Action items written at the FCA/PCA will be listed and tracked by the PG to closure.

I.1.2.3.9 ACTION ITEM CLOSURE

Action items written at the FCA/PCA will remain open until closure has been agreed to by the Prime.

I.1.2.3.9.1 ACTION ITEM TRACKING/STATUSING, REPORTING

Action items will be tracked and statused as follows:

a. Following the conduct of an FCA/PCA wrap–up meeting the PG will establish an Action Item tracking system which will provide status of the action items. The tracking system will provide reports on status which will be provided to the Prime.

b. Updates to the status charts will be provided to the Prime on a pre–established schedule.

I.1.2.3.9.2 ACTION ITEM RESPONSE

The following will be the criteria for Action Item Response:

a. All official PG submittals to the Prime in response to action items will be via contracts letters.

b. Correspondence relative to Prime Contractors response to the submitted action item will be via contracts letter.

c. Successful accomplishment of an FCA/PCA occurs only when all action items are closed and the PG receives a Prime Contracts letter stating that the audit is closed.

d. The Prime and PG FCA/PCA Co chairpersons will determine and document at the FCA/PCA, any open action items which must be closed prior to software/hardware delivery by the PG.

I.1.3 CONFIGURATION MANAGEMENT COMPLIANCE AUDIT

Boeing is responsible for properly flowing down its requirements to its subcontractors and assuring their compliance to the same. CM compliance audits may be performed to monitor compliance. The objective of these audits is to verify the adequacy of the PG configuration management systems, and to assure compliance with the requirements of SSP 41170. An additional objective is to develop the required corrective actions where inadequacies and noncompliances are identified.

The requirements established and defined within SSP 41170, "Configuration Management Requirements," will be used by the PGs in implementation of their CM systems. The configuration management discipline required during the entire life cycle of the program warrants periodic audits to evaluate configuration management methods, systems, and operations. These audits will assist Program management in gaining assurance that there is program compatibility of CM activities and that the requirements of the program are being satisfied.

I.1.3.1 RESPONSIBILITIES

The Prime CMAIT has responsibility to establish and chair a CM Audit Team which will conduct the PG CM Compliance audits. The Chairman has responsibility to:

a. Develop and distribute a detailed plan and agenda for conduct of each CM audit.

b. Provide personnel to the audit to cover the following major review areas:

    1. Organization

    2. Identification

    3. Change Control

    4. Status Accounting

    5. Verification

c. Conduct a pre–audit meeting to finalize plans and resolve any problems relative to conduct of the audit.

The audited PG will have responsibility for:

a. Facilities for the audit team (space, telephones, typing assistance, etc.)

b. Monthly reports to the audit team Chairman until final closeout of action items.

c. Providing a CM person to serve as primary point of contact during the audit.

d. Providing copies of CM procedures and policies and other documentation as requested at time of audit.

I.1.3.2 AUDIT PROCESS

The audit team will perform an in–depth evaluation of the PGs CM system and its related activities. The audit will be conducted in accordance with the following paragraphs.

I.1.3.2.1 BASELINE REQUIREMENTS

The baseline for the audit will be SSP 41170 and the PG documentation which describes the implementation of the CM requirements.

I.1.3.2.2 AUDIT TEAM PRE–AUDIT PREPARATION

The audit team will become familiar with the audit baseline in order to expedite the conduct of the audit and to participate in the audit activities in an efficient manner with a minimum of interruption to the day–to–day activities of the PG.

I.1.3.2.3 AUDIT ENTRANCE MEETING

An audit entrance meeting will be conducted at which time the Audit Team members will meet with the appropriate personnel from the PG. This meeting will be held at the start of the audit period at the audit site. The audit team chairman and/or selected team members will outline the purpose and scope of the audit, planned audit activities, schedules, responsibilities and the

method of documenting findings. The audited PG should address its organization, operations, and specific subjects of interest which the audited organization believes will be beneficial to the audit team.

I.1.3.2.4 AUDIT PROCEDURES

Formal notification will be made to the PG, through the Contract/Materiel organization, at least 30 days prior to the planned audit. The notification will be made by the audit team chairperson and shall include the following as applicable:

a. Audit subject

b. Inclusive dates of audit

c. Audit team members

d. Site of the audit

The audit will generally adhere to the requirements as defined in SSP 41170. The following specific areas will be covered to verify the adequacy of CM procedures and their implementation:

a. Organization

b. Identification

c. Verification

d. Change Control

e. Status Accounting

I.1.3.2.4.1 ORGANIZATION

Organization will cover the configuration management organization that has been established or is proposed to support all aspects of CM. Relationship of the audited PG's CM organization to the rest of the organizational elements will be identified.

I.1.3.2.4.2 IDENTIFICATION

Identification will include definition documentation and specifications including numbering systems, identification of hardware and software CSCIs and the mechanism for flow down of CI requirements to lower levels including subcontractor levels. Engineering release desk operations will be defined. The CI numbering system will be described, including all identifications used (part numbers, serial numbers, configuration item numbers, etc.) to designate flight items, support equipment, test articles, mod kits, etc.

I.1.3.2.4.3 VERIFICATION

Verification will identify planning for verification that all hardware and software performance and design requirements are met including safety and product assurance. Acceptance requirements will also be identified and applicable verification planning specified.

I.1.3.2.4.4 CHANGE CONTROL

Change control will cover all configuration management organizations and control boards, and assure they are established and in operation. Change processes and procedures will be reviewed for adequacy and compliance with program requirements.

I.1.3.2.4.5 STATUS ACCOUNTING

Responsibilities, procedures and planning for accounting for the status of all requirements, procedural and product changes, including contract changes as applicable, will be defined. Plans for identifying as–designed, as–built, as–tested, as–accepted, as–delivered and as–flown hardware and software status will be presented. Plans for identifying the status of modification kits, software versions, accepted deviations and waivers, in–flight removals and installations and post flight(returned items) repair and/or disposition shall also be presented. Methods for correlating the PG's status accounting system with the Prime Contractor's status accounting system will be presented.

I.1.3.2.5 TEAM REVIEW ACTIVITIES

Subsequent to the Entrance meeting, the audit team members will meet with the appropriate PG personnel and begin their review. Each member will have a subject checklist to aid in determining the adequacy of the program. The review process shall include personnel interviews (question and answers), observing the method of operation, reviewing requirements and change documentation, and, as applicable, engineering, manufacturing planning, etc. Tracking of selected items will be accomplished and will be used to help verify processing activities.

I.1.3.2.6 TEAM FINDINGS

Findings and observations, as defined below, will be documented on an "audit Evaluation Report" form (see Appendix B). Each team member will present a preliminary report that summarizes that member's findings, observations, and recommendations for corrective action to the Audit Team Chairman prior to the Exit Meeting. Each finding will include a target date for resolution. This report will contain an accurate description of individual non–conformance in sufficient detail to provide conclusive evidence of the existing situation. These preliminary reports should be the basis for discussion during the Exit Meeting.

I.1.3.2.6.1 FINDING

Deviation from a documented requirement and is a statement of fact identifying the deficiency observed.

I.1.3.2.6.2 OBSERVATION

A suggestion for improving operations, not based on a specific requirement, is an acknowledgment of a commendable practice.

I.1.3.2.7 TEAM ASSESSMENT MEETINGS

Meetings of the audit team members or individuals, as directed by the Chairperson, will be conducted to establish requirements, for reviewing daily activities, to adjust schedules as needed, and to coordinate the remaining audit review activities.

I.1.3.2.7.1 AUDIT TEAM MEETING MINUTES

Audit Team Meeting Minutes will be the responsibility of the audit team chairperson. This responsibility encompasses all official gatherings of audit personnel, team meetings, and meetings with the PG, including the Entry and Exit Meeting.

I.1.3.2.8 EXIT MEETING

An exit critique will be held with key PG personnel to discuss the preliminary results of the audit. The PG personnel will be given an opportunity to explain any unusual or discrepant information obtained by the audit team members. The critique will normally be held the day following the completion of the review.

I.1.3.2.9 AUDIT EVALUATION REPORT TRACKING

Each Audit Evaluation Report will be tracked and statused until closed. An item will not be closed until the recommendation has been implemented or other resolution completed. Closure of findings will be approved by the Audit Team Chairman. The PG will provide a monthly status report on all open findings to the Audit Team Chairman.

I.1.3.3 AUDIT REPORT

A final audit report will be prepared by the team within 20 days after conclusion of the audit review. This report will be a consolidation of the findings and/or observations, descriptions, determinations, and recommendations. This report will include a general overall Audit Team reaction with the most significant findings summarized.

I.1.3.4 CORRECTIVE ACTION IMPLEMENTATION

The Audit Team Chairman will prepare a letter of transmittal for the minutes and corrective actions items and process it through the Materiel organization. The Audit Team will take all proper follow–up actions to verify that corrective actions are implemented.

I.1.3.4.1 REPEAT OR SUBSEQUENT AUDITS

The Prime Contractor may conduct repeat or subsequent audits to either follow–up implementation of corrective actions or to review specific aspects of a system where compliance

cannot be ascertained, or for review of those requirements that have not been implemented at the time of the audit.

I.1.4 NASA AUDITS OF CONFIGURATION MANAGEMENT SYSTEM

NASA CM will conduct periodic Configuration Management System Audits of the following:

a. Boeing Prime

b. Program participants

c. Other contracted by NASA for ISSA

NASA CM may participate in Prime CM audits of the following:

a. PGs

b. PG subcontracts

The objective of these audits is to verify the adequacy of the CM systems and to assure compliance with NASA CM requirements. The audits will determine the adequacy of implementation as practiced by each of the above. Another objective will be to specify corrective action when inadequacies and noncompliances are identified. The audits will also verify compliance with the NASA CM requirements.

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**APPENDIX J CONFIGURATION MANAGEMENT ANALYSIS AND INTEGRATION TEAM
AIT/IPT SUPPORT**

TABLE OF CONTENTS

ATTACHMENTS

J.1 PURPOSE

This Appendix provides guidelines for CM support to selected IPTs and AITs. Specific tasks will vary for each IPT/AIT, dependent upon the charter and operating procedures of each team.

J.2 FUNCTIONS

The CMAIT will provide the following:

a. Assistance with application of general CM principles and practices to the AIT/IPT activity

b. Evaluation and maintenance of AIT/IPT compliance with program and contractual requirements including the following:

    (1) Review of contract documentation

    (2) Preparation and/or evaluation of contract change language

    (3) CM training for AITs/IPTs

    (4) Development and maintenance of documentation and drawing trees

    (5) Design reviews and configuration audits

c. AIT/IPT issue resolution support

    (1) Facilitation of information flows between AITs and IPTs

    (2) Issues tracking, agenda development and distribution, minutes and action item recording, and distribution

d. Support in planning, implementation, and administration of ISSA integrated change process as applicable to AITs/IPTs

    (1) Support to Change Engineer in initiation and processing of Program and Prime baseline changes

    (2) Processing, statusing transmittal and receipt of changes, and change related data

    (3) Change integration and change packaging support for Program and Prime baseline changes

    (4) Change Management training of AITs/IPTs

e. Coordination with CM support team as required to support AIT/IPT activities in the following areas of:

    (1) Document and drawing release

    (2) Data Quality Assurance

    (3) Software CM

    (4) Configuration Status Accounting

        — Change Tracking System

        — Hardware and Software Configuration Status Accounting

J.3 SUPPORT AGREEMENTS

As agreements are obtained through Memorandums of Agreement and Task Agreements between the CMAIT and other IPTs/AITs and program participants, those agreements and other support arrangements will be included as attachments to this appendix.

ATTACHMENT A TO APPENDIX J CONFIGURATION MANAGEMENT AGREEMENT FOR PROCESSING CHANGE DIRECTIVE ACTIONS AND CHANGE EVALUATIONS CONCERNING ISSA PROGRAM PARTICIPANTS OPERATING UNDER TASK AGREEMENTS

Configuration Management Agreement for processing Change Directive Actions and Change Evaluations concerning ISSA Program Participants Operating Under Task Agreements

It is the responsibility of the appropriate ISSA Program level IPT/AIT leader to manage all aspects of approved task agreements with NASA Program Participants organizations supporting the ISSA Program. Team leaders shall ensure that the CM requirements contained in SSP 41170 are included in all task agreements involving Design Development Test and Evaluation (DDT&E) and delivery of Program hardware or computer software used on the ISSA Program.

The ISSA Program CMAIT shall support the IPT/AIT leaders in the management of task agreements relative to CM activity. In this regard, the following processes for assignment of SSCB Action Items contained in CD, and incorporation of Change Evaluations (CE) into Change Paper shall be implemented.

Change Evaluations

CEs that require a response by the following task agreement Program Participants [Marshall Space Flight Center (MSFC)/Operations and Utilizations (O&U), JSC/Mission Operations Directorate (MOD), KSC Operations, JSC/Engineering, and JSC/Life Sciences, etc.] will be assigned to the appropriate IPT/AIT leader that manages the task agreements. The formal flowdown of direction and CE is the responsibility of the Program IPT/AIT leader. It is the responsibility of the Program Participants to provide the CE to the Program IPT/AIT leader. The IPT/AIT leader will approve the CEs and forward to the CMAIT. This process is further defined in the attached CE flowchart.
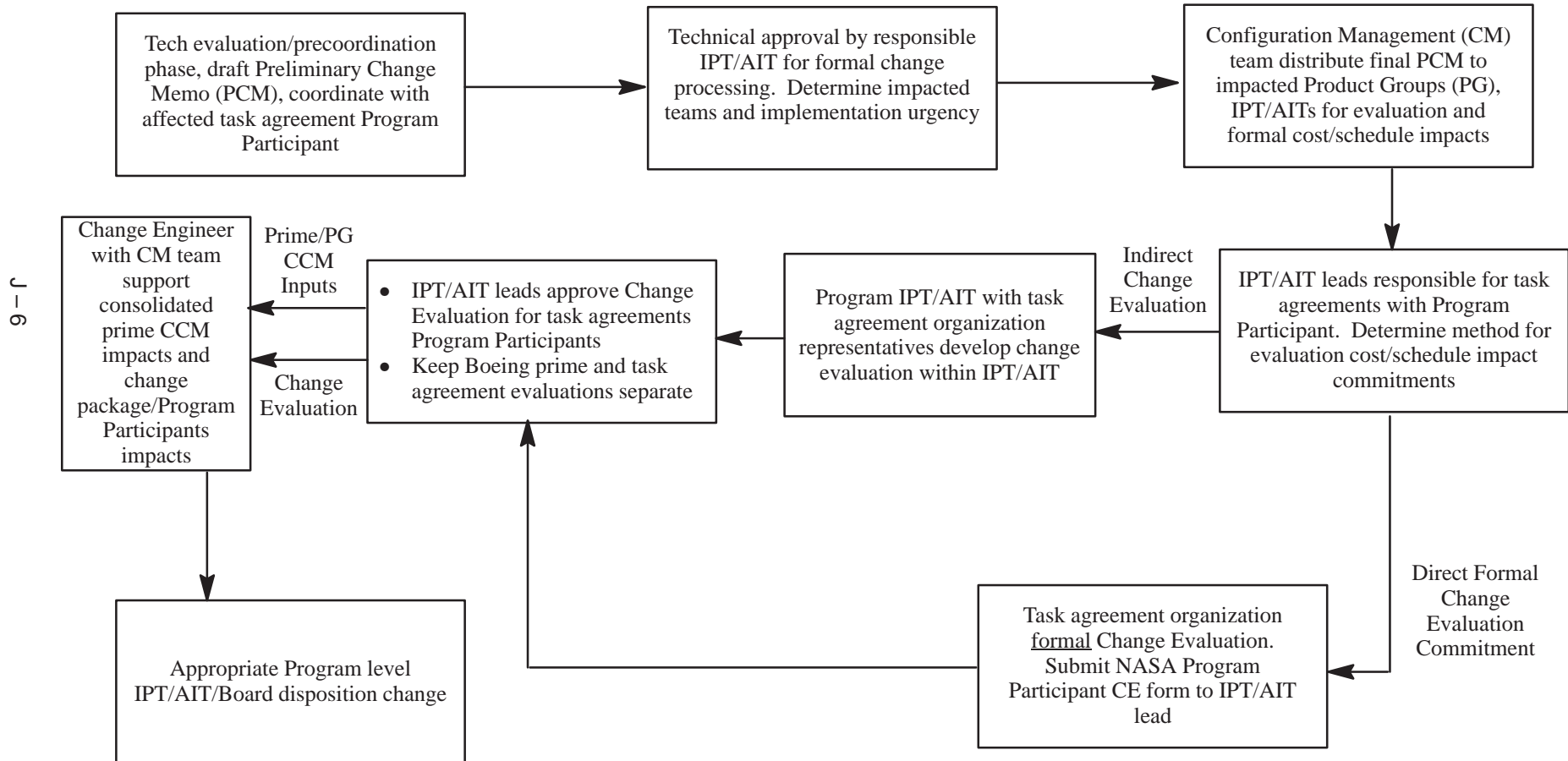
Change Directives

CD action items that require a response by the following task agreements [MSFC/O&U, JSC/MOD, KSC Operations, JSC/Engineering, and JSC/Life Sciences, etc.] will be assigned to the appropriate IPT/AIT leader that manages the task agreements. The formal flow down of direction action item and closed–out verification is the responsibility of the Program IPT/AIT leader. It is the responsibility of the Program Participants to provide the action closure to the

Program IPT/AIT leader. The IPT/AIT leader will approve the action item closure and forward to the CMAIT. This process is further defined in the attached CD flowchart

/s/ Arthur Bond	6/22/94	/s/ Chirold D. Epps	7/18/94
Configuration Management AIT/Arthur Bond	Date	Operations IPT/Chirold Epp	Date

/s/ N. Solvik	6/23/94	/s/ Michelle A. Brekke	6/28/94
Configuration Management AIT/Norman Solvik	Date	Utilization IPT/Michelle Brekke	Date

/s/ Douglas R. Cooke	7/28/94
Vehicle IPT/Doug Cooke	Date

CHANGE EVALUATION FLOW

Submittal of formal Change Evaluations to Change Memos for impacted
task agreement Program Participants will follow this process.

Tech evaluation/precoordination phase, draft Preliminary Change Memo (PCM), coordinate with affected task agreement Program Participant	Technical approval by responsible IPT/AIT for formal change processing. Determine impacted teams and implementation urgency	Configuration Management (CM) team distribute final PCM to impacted Product Groups (PG), IPT/AITs for evaluation and formal cost/schedule impacts

Change Engineer with CM team support consolidated prime CCM impacts and change package/Program Participants impacts

Prime/PG CCM Inputs

- IPT/AIT leads approve Change Evaluation for task agreements Program Participants
- Keep Boeing prime and task agreement evaluations separate

Change Evaluation

Program IPT/AIT with task agreement organization representatives develop change evaluation within IPT/AIT

Indirect Change Evaluation

IPT/AIT leads responsible for task agreements with Program Participant. Determine method for evaluation cost/schedule impact commitments

Direct Formal Change Evaluation Commitment

Appropriate Program level IPT/AIT/Board disposition change

Task agreement organization _formal_ Change Evaluation. Submit NASA Program Participant CE form to IPT/AIT lead

CHANGE DIRECTIVES FLOW

Assignment of action items requiring task agreement Program Participants
response or implementation will follow this process.

```
┌──────────────────┐     ┌──────────────────┐     ┌──────────────────┐     ┌──────────────────┐
│ CM team prepare  │     │ CM coordinate    │     │ If task agreement│     │ Responsible      │
│ draft            │────▶│ with appropriate │────▶│ organization is  │────▶│ IPT/AIT/Board for│
│ Change Directive │     │ IPT/AIT for      │     │ impacted assign  │     │ disposition of   │
│ (CD)             │     │ impact on task   │     │ Action Item to   │     │ change,          │
│                  │     │ agreement        │     │ responsible      │     │ approve CD       │
│                  │     │ organization     │     │ program IPT/AIT  │     │                  │
│                  │     │                  │     │ lead             │     │                  │
└──────────────────┘     └──────────────────┘     └──────────────────┘     └──────────────────┘
```

IPT/AIT lead (actionee) for task agreements determine appropriate method to implement/close–out the Action Item with the task agreement organization

Direct implementation

CM team issue Action Items to actionees with close–out form

CM team distribute approved CD and enter Action Items into tracking system

Task agreement organization implement/ close–out Action Item and submit close–out form

Indirect implementation;
program team with task
agreement organization
representative implementation
Action Item

IPT/AIT lead (actionee) verify Action Item implementation/close–out and submit completed close–out form to CM AIT

CM AIT team close–out Action Item and complete closed loop account change records

(This page reserved)

APPENDIX K ACTION ITEM PROCESS

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FIGURES

ATTACHMENTS

K.1 PURPOSE

Appendix P defines and establishes an integrated action item process that provides the means and authority for the initiation, processing, approval and incorporation of all action items on the ISS Program. Characteristics of this integrated action item process include: using a common action item closure form; implementing a common process for documenting, tracking, and reporting action items; providing a common action item tracking database, ensuring a closed–loop accounting system for action items, and placing an emphasis on assigning actions that are verifiable, closeable, and complete.

K.2 RESPONSIBILITIES

K.2.1 PROGRAM DEFINITION AND CHANGE INTEGRATION AIT

Program Definition and Change Integration AIT will do the following:

a. Act as the Action Tracking System (ATS) focal point for the ISS Program

b. Maintain the ATS database for SSCB action items, directive action items, ISS Program Review Board action items and any others requested by ISS Program Manager

c. Provide automated action item close–out forms to actionees

d. Assist actionees in understanding the action item closure process

e. Coordinate with actionees on delinquent action items to determine new Estimated Completion Dates (ECDs)

f. Determine when an action item adjusted ECD date is not being met and warrants the actionee's manager's involvement

g. Track, report, and document action item closures

h. Report status of open, closed, and delinquent actions items to ISS Program Manager weekly at the Program Manager's Review (PMR).

K.2.2 CHANGE MANAGEMENT TEAM

Change Management will do the following:

a. Coordinate with Actionees prior to assigning action items on directives

b. Coordinate with Program Definition and Change Integration AIT prior to having directives signed by the Program Manager

K.2.3 ACTIONEES

Actionees will do the following:

a. Implement the assigned action item as appropriate

b. Complete the action item closure form and sign the form

c. Obtain appropriate IPT team leader's signatures on action item close–out form

d. Provide completed/signed action item closure form and closure rationale to Program Definition and Change Integration AIT by due date

e. Coordinate and provide new ECDs/rationale to Program Definition and Change Integration AIT when an action item will be completed later than the original due date

K.2.4 EXECUTIVE SECRETARY

Executive Secretary will do the following:

a. Review the action item closure rationale to determine if it is sufficient to close the action

b. Sign the Action Item Closure form as appropriate

K.3 ACTION ITEM PROCESS FLOW

The integrated action item process will be used to support the assignment, tracking, reporting, and documentation of all Program level action items. See Figure K–1.

K.3.1 ACTION ITEM PRECOORDINATION PHASE

The Change Management Team will coordinate with the proposed actionees to determine the applicability of the action, the appropriate due date, and overall technical content of the directive action item. The Change Management Team will also coordinate with the Program Definition and Change Integration AIT to ensure the action items are verifiable and are complete prior to submittal to the Program Manager and the International Partners for directive or minutes approval.

K.3.2 DIRECTIVE ACTION ITEM IDENTIFICATION AND NUMBERING

Identification of action items assigned as part of a directive will consist of the directive number followed by a sequential numeric action item number and an actionee identifier:

Example: DR: 000002 (1–1) CSA/OR/B. Erb

DR: 000002 (Directive number)

(1–) (First action item on directive)

(–1) (First actionee of that action item)

CSA/OR (Actionee organization/mail code)

B. Erb (Actionee's name or manager's name)

```
┌─────────────────────┐     ┌─────────────────────┐     ┌─────────────────────┐     ┌─────────────────────┐
│  Pre–coordination of│ ──▶ │   Actions assigned by│ ──▶ │  Enter action items  │ ──▶ │  Print action tracking│
│  directives/action  │     │  directives/action   │     │  into action tracking│     │  reports and closeout│
│       items         │     │     meetings         │     │      system          │     │       forms          │
└─────────────────────┘     └─────────────────────┘     └─────────────────────┘     └─────────────────────┘
```

```
┌─────────────────────┐     ┌─────────────────────┐  Status  ┌─────────────────────┐     ┌─────────────────────┐
│  Distribute actions  │ ──▶ │ Program Definition and│ ──────▶ │  Distribute delinquent│ ──▶ │  Present weekly to    │
│  and closeout forms  │     │ Change Integration AIT│         │  action item report  │     │  Program Management a │
│   to actionees       │     │ records closure/or    │         │  and redistribute     │     │  status of open/closed│
│                      │     │ status of action item │         │  action item closeout │     │  delinquent actions   │
│                      │     │                       │         │  forms to actionees   │     │  and actionees        │
└─────────────────────┘     └─────────────────────┘          └─────────────────────┘     └─────────────────────┘
```

```
┌─────────────────────┐          │ Close                         │
│ Actionee closes the  │          ▼                               ▼
│ action.  Submit      │     ┌─────────────────────┐     ┌─────────────────────┐
│ completed closeout   │     │ Verify A/I closeout  │     │  Work with actionees │
│ form to Program      │     │ form has actionee,   │     │  and their management│
│ Definition and       │     │ team leader, change  │     │  to secure           │
│ Change Integration   │     │ management initials  │     │  improved/coordinated│
│ AIT or a status/ECD  │     │ and SSCB executive   │     │  ECDs                │
└─────────────────────┘     │ secretary signature  │     └─────────────────────┘
                            └─────────────────────┘
                                     │
                                     ▼
                            ┌─────────────────────┐
                            │ Action closed in     │
                            │ action item tracking │
                            │ system and filed in  │
                            │ the Program Definition│
                            │ and Change Integration│
                            │ AIT                  │
                            └─────────────────────┘
```

K–1 ISSA ACTION ITEM FLOW

K.3.3 PROGRAM LEVEL ACTION ITEM IDENTIFICATION AND NUMBERING

Identification of action items recorded in minutes will consist of the year of the meeting followed by the month, day of the meeting, a sequential numeric action item number and an actionee identifier:

Example: SSCB 940207 (1–1) NASA/OA/B. Bates

SSCB (Origin of action item)

94 (Calendar year)

02 (Calendar month)

07 (Day of month)*

(1–) (First action item assigned)

(–1) (First actionee of that action item)

NASA/OA (Actionee organization/mail code)

B. Bates (Actionee's name or manager's name)

*If the meeting extends past one day, the first day's date is to be used for identifying all action items assigned by that set of minutes.

K.3.4 ACTION ITEM TRACKING SYSTEM

The ATS is maintained in an automated Foxpro database. The ATS database resides on the Novel network server and is readable from remote locations. ATS will support the tracking of actions/issues from any meeting. However, a unique numbering system should be assigned for each meeting similar to the methodology used for SSCB minutes' action items. To obtain access or information to the ATS, contact the ATS administrator.

K.3.5 ACTION ITEM DISTRIBUTION

Open action item reports and action item closure forms will be provided to each actionee once the action item has been entered into the ATS. Action Item Close–out Form and action item close–out instructions, are provided in Attachment A. Actionees that have action items that are past due will receive action item closure forms Thursday of every week until their action is closed. Program Definition and Change Integration AIT will present a status of open and past due actions to the PMR on a weekly basis. Past due action items will be highlighted at these meetings. The goal is to close out all action items within thirty days of being assigned.

K.3.6 ACTION ITEM CLOSURE AND VERIFICATION

The following procedures will be followed to close an action item:

a. The standard action item closure form as provided to Actionees by Program Definition and Change Integration AIT, will be signed by the actionee and actionee's team leader. (Note: If the actionee and team leader are one in the same, only one signature is required.)

b. Documented evidence such as directives, letters, contract change authorization, etc., should accompany the action item closure form where practical.

c. Presentation to the SSCB, or other Program level boards, AITs, or IPTs can also be used as justification for closure.

d. The SSCB Chairman may cancel an action item at any time due to subsequent changes, program redirection, or obsolescence.

e. The SSCB Executive Secretary will be responsible for accepting the close–out documentation and verifying the closure of the action item.

Under no condition will action items be closed without an action item closure form bearing an authorized signature.

K.3.7 ACTION ITEM STATUS REPORTING

The Program Definition and Change Integration AIT Leader presents weekly, to the PMR the status of open, closed and/or delinquent action items.

ATTACHMENT A TO APPENDIX K
ACTION ITEM CLOSE OUT
FORM AND PREPARATION INSTRUCTIONS

The ISSA Action Item Closure form should be completed by the actionee. Appropriate documentation should be provided to the Executive Secretary who is responsible for verifying closure of an action. Additional documentation may be attached as necessary.

Program Definition and Change Integration AIT will complete blocks 1, 2, and 3. The actionee is responsible for completing blocks 4, 5, and part of 6.

Use the following instructions to complete each block on the form:

4. Closeout Disposition – Check the appropriate box to indicate the close–out disposition as follows:
    — No Impact (self–explanatory)
    — Implementation if the action has been completed; correspondences or additional documentation may be attached to verify closure

    In addition, enter any remarks clarifying the close–out disposition.

5. Completion/Closeout Approval – The Actionee that completes/verifies the action closure, enter signature and date.

6. ISSA Closeout Verification/Approval – The actionee's IPT/AIT Team Leader will sign and date the form, signifying concurrence of the closure. Note: This signature is not necessary if the Team Leader and Actionee are one in the same.

    Once the actionee has completed blocks 4, 5, and the designated portion of block 6, the closure form with attachment should be submitted to the Program Definition and Change Integration AIT for processing.

INTERNATIONAL SPACE STATION
SPACE STATION CONTROL BOARD
Action Item Close Out

---

1. Action Item Number:

2. Actionee:

---

3. Action Item Description:

---

4. Closeout Disposition (Check Appropriate Box:

☐   **No Impact**

☐   **Implemented (Attach Applicable Documentation and/or Correspondence)**

       Due Date:

       Remarks:

---

5. Completion/Closeout Approval (Actionee):

     Actionee: _____   **Date:** _____

---

6. ISS Closeout Verification/Approval:

IPT/AIT Team Leader: _____   **Date:** _____

    **SSCB Executive
Secretary:** _____   **Date:** _____

APPENDIX L SOFTWARE CONFIGURATION MANAGEMENT

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FIGURES

L.1 SCOPE

This appendix describes how various CM functions are applied to software development, production, and maintenance. These functions are implemented during the software development life cycle in various program phases. Briefly, Software Configuration Management (SCM) is the discipline which provides technical and administrative direction and surveillance to the following:

a. Identify and document the functional and physical characteristics of each CSCI

b. Control changes to these characteristics

c. Record and report the processing of changes and the status of implementation

d. Conduct FCAs and PCAs

SCM will be performed within the framework of the system CM and will ensure that integrated procedures address the total system requirements, including such items as firmware, hardware, related CIs and CSCIs, support and training elements and facilities, and Government–furnished hardware and software, as applicable.

L.2 SOFTWARE IDENTIFICATION

Software identification will be defined in applicable Software Development Plans.

L.2.1 COMPUTER SOFTWARE CONFIGURATION ITEM IDENTIFICATION

Each CSCI will be marked by the originator with the following information at the time of manufacture and at the time of each change:

a. Contract number

b. CAGE code for the CSCI manufacturer

c. CSCI number

d. CSCI serial number

e. CSCI version number

f. CSCI part number

For programmable memory devices which are too small to apply the marking externally, the information will be recorded as an electronic record in the device. The format should be compatible to the operational use of the CSCI.

L.2.2 COMPONENT/UNIT IDENTIFICATION

The unit/component memory device (physical apparatus capable of storing data) for unlinked units and components for one or more CSCIs will be marked with a unique serial number. The following information will be electronically encoded to a generation identification file on the device:

a. Unit/component device identification number

b. Device identification number

c. Device version number

d. Device serial number

Each unlinked unit and unlinked component will be identified at the time of initial release and at the time of each change by an electronic record on the unit/component device which contains the following information:

a. Units

    (1) CSCI number

    (2) Unit identification number

    (3) Unit version number

    (4) Component identification number

b. Components

    (1) CSCI number

    (2) Component identification number

    (3) Component version number

L.3 ENGINEERING RELEASE OF SOFTWARE DOCUMENTS AND MEDIA

Documents and code will be released on ISSA after they have been checked and approved by the authorized individual in the Program. The individual authorized to check and approve documents and code will be independent from the individual(s) producing these items, and will have the resources, responsibility, authority, and freedom to ensure objective evaluation and to cause the initiation and verification of corrective action. Within the prime organization approved media is submitted to SCM for verification that all requirements for release have been met. This control is required to ensure that the product has been reviewed internally, that all change commitments have been made, and that no unauthorized changes can be made after the release. In addition, SCM will maintain a log of released items including element names, numbers, and next higher components. The copies of the released masters will be retained in the Software Development Library (SDL).

L.4 CONFIGURATION CONTROL

The purpose of configuration control is to ensure the effective control of the approved configuration identification during the various phases of the program. All changes to the formally baselined documents and code for each CSCI will be placed under change control.

Software and its associated data will come under various types of controls. During development, software and data will be under internal change control and SCM will assist engineering in

maintaining problem reporting and control as required. Once software has been placed under configuration control a problem reporting system will be used to track all problems, their resolution, and implementation status. These problem reports and their resolution will be approved and authorized by the appropriate software review teams to insure that only authorized changes are incorporated. SCM will use this tracking system and problem reports to allow for change incorporation and to show traceability, baseline development, and to insure that the software and documentation reflects only approved and authorized changes. (See Figure L–1.)

L.5 SOFTWARE DEVELOPMENT LIBRARY

The SDL will serve as the data control center for the software components of the Program. It will be a repository for computer software products and related software documentation and media, ensuring proper identification, control, status accounting, recording, filing, maintenance, safeguards, and retrieval. When software and documentation are ready for internal release (after unit test), they are submitted to the SDL using a (TBD form). The SDL is used to preserve and control these formally released software media and documents which represent the official configurations for the ISSA.

Control is exercised in the following ways:

a. Write access to the SDL will be limited to SCM personnel.

b. After release and submittal of media or documentation to the SDL, no change can be made directly to that media. Changes will be made to copies of the media and submitted with the appropriate authorizing change paper to the SDL for entry into the master by SCM personnel.

c. Changes to media submitted for incorporation to the master will be identified by software problem number, team change number, and/or ECP number.

d. The SDL will maintain records of software development status, software problem and change tracking, and release coordination.

The SDL will serve as a controlled link between programmers and released software, providing developers with access to their work, while ensuring that the approved configuration of program media is maintained until change is authorized. (See Figure L–2.)

L.6 CORRECTIVE ACTION PROCESS

Each PG may use its own internal software corrective action system which tracks and processes changes to software and software documentation. Each such system will use a Software Change Request (SCR) (TBD form) or its equivalent form to document inadequate or incorrect statements in program documentation, errors in software design, and/or defects in code. SCRs are submitted to SCM, which serves as the processing focal point for
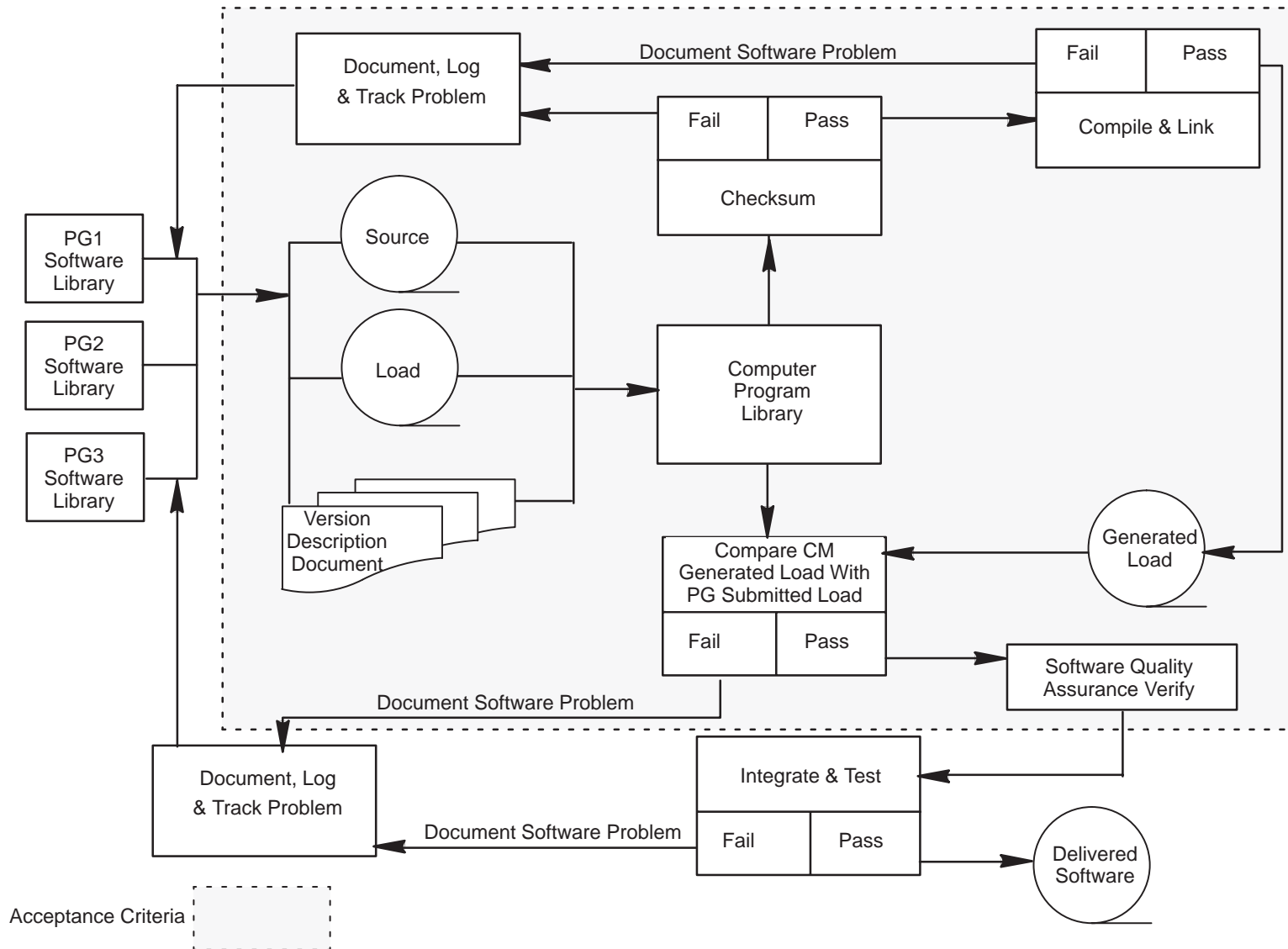
FIGURE L–1   CONFIGURATION CONTROL

UNDER SCM CONTROL

SOFTWARE DELIVERIES

COMPUTER PROGRAM LIBRARY
(CPL)

ORIGINAL SOURCE

SOFTWARE DEVELOPMENT LIBRARY
(SDL)

ESTABLISH ORIGINAL BASELINE

BASELINE n

SCM CONTROLLED BUILD

RELEASED SOFTWARE

SOURCE EXTRACT

BUILD REQUEST

ENGINEERING DEVELOPMENT LIBRARY
(EDL)

DESIGN

CODE

TEST
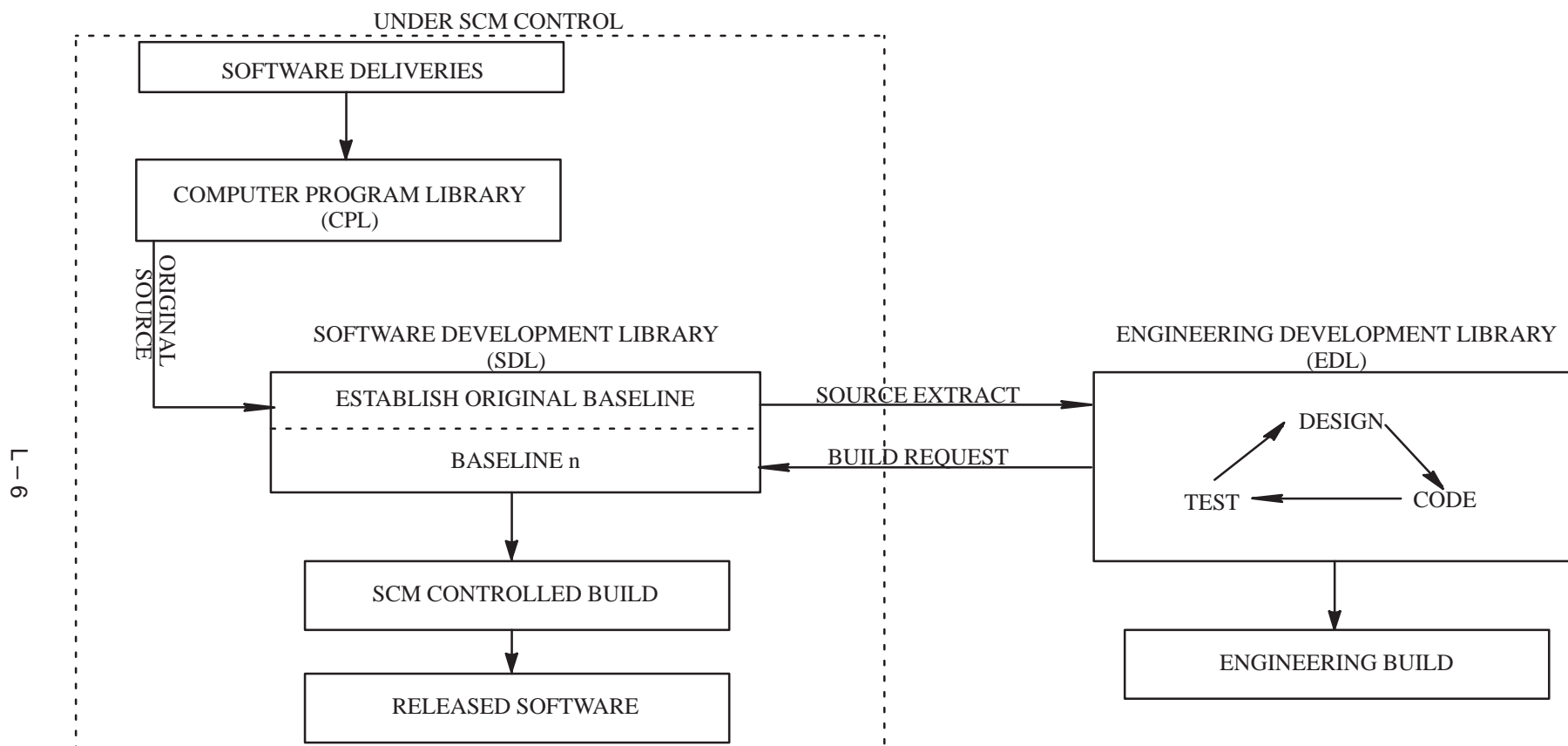
ENGINEERING BUILD

FIGURE L–2   SOFTWARE CONFIGURATION MANAGEMENT SOFTWARE LIBRARIES

proposed changes. SCM assigns a number to the SCR, enters it in the SCR log, and routes copies to Engineering and Software Quality Assurance for problem analysis and coordination. The SCM compiles responses and provides the data to the Software Review Board (SRB) for disposition.

Problems which impact the PG's contractual baseline will be submitted to the Prime for disposition. See Appendix C of this Handbook for an in–depth discussion of processing of changes.

Problems identified by external interfacing organizations which impact software under prime control are provided to the appropriate IPT for disposition.

L.7 GENERAL STATUS ACCOUNTING

Configuration status accounting provides the information needed to identify the configuration and determine the status of change proposals, deviations, and waivers including implementation status. The Status Accounting Report for a CSCI provides information concerning traceability of configuration baselines and changes to them, computer programs, specific CSCIs and their lower–level components, and related documentation in a controlled access environment. The technique for tracking and reporting the configuration status of delivered CSCIs is the same for hardware and may be integrated into a single reporting system.

Configuration status accounting records and reports ensure that there will be a configuration record documenting all approved changes to all designated CSCIs. A Configuration Status Accounting system will be instituted upon approval of the functional baseline. CSCIs and their components are entered into the Configuration Status Accounting database as they are released. Periodic status reports will be provided on all products in the developmental configuration and the allocated and product baselines. These reports will do as follows:

a. Provide traceability of changes to controlled products
b. Serve as a basis for communicating the status of each CSCI and its released components
c. Serve as a vehicle for ensuring that delivered documents describe and represent the associated software

L.8 SPECIAL CONSIDERATIONS FOR SOFTWARE STATUS ACCOUNTING

Software status accounting requires several logs and reports in addition to the standard reports. The Software Problem Status Report, by category of failure and its priority, will be maintained from the beginning of the program or when Software Problem Reports (SPRs) are first used. In addition, the status of software changes and modifications is tracked and logged by SCM personnel in the SDL. Information from this log should be entered into the CSAR where appropriate. A patch log if required will also be maintained in the SDL, documenting each patch to a CSCI during the program. Entries to the patch log are closed out when the patch is incorporated into the CSCI. All patches to released engineering software (whether put in before

release or after) should be documented by the appropriate released code and/or documentation. Status reports based upon these logs will be issued on a regular basis depending on program requirements.

APPENDIX M INTERFACE WORKING GROUP SUPPORT PLAN

M.1 TBD

(This page reserved)

APPENDIX N CANADIAN SPACE AGENCY CONFIGURATION MANAGEMENT PROCESS/INTERFACE

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NOTE: The CSA Configuration Management Process, Appendix N, is a draft subject to final agreement between CSA and NASA.

N.1 PURPOSE

This appendix defines and establishes an integrated change process that provides the means and authority for the initiation, processing, approval, and incorporation of changes. Characteristics of this integrated change process include the following: using a common change form; implementing a common process to define and evaluate all technical, cost, and schedule impacts; coordination between NASA and CSA; and placing an emphasis on the IPT/AIT which provides processing and disposition of changes at the lowest level possible. The CSA will utilize their existing configuration control methods within their Agency, but will utilize the ISSA PCM/CCM as documented in Attachment A to Appendix C for processing changes to the Program. Changes will be precoordinated and provided to the appropriate program level IPT/AIT for processing in accordance with Figure C–1.

N.1.1 SCOPE

The scope of the NASA/CSA Configuration Management interface will include the control and maintenance of NASA/CSA bilateral and multilateral documents.

N.2 CHANGE PROCESS STEPS

The ISSA integrated change process will be used to support the development of all changes on the Program. Target processing flow times for each change classification are provided in Table C–1. However, flow times may vary from these targets based upon the complexity of the change, NASA/prime management direction, the number of changes currently in process, or the urgency of the change. The Change Engineer will determine the specific response time for each change action.

N.2.1 TECHNICAL EVALUATION/PRECOORDINATION PHASE

This phase is intended to provide the CSA and other program participants with a method to get proposed changes reviewed and into the formal change process. As unresolved issues are reviewed by the appropriate program level IPT/AIT and determined to have a cost schedule or technical impact on the Prime/PGs, International Partners, and NASA program participants, a DDP will be developed to define the proposed changes to the technical/contract baselines. The DDP will be precoordinated with other affected prime IPTs/AITs, PGs, NASA organizations, and International Partners using the process defined in Figure C–1. This will be accomplished prior to submittal of the DDP for review and disposition, and prior to formal processing. Earlier involvement in the change process can be achieved though participation in the VAIT/IPT. A Change Engineer will be assigned by NASA. The Change Engineer, with support from the NASA Finance organization, as required, will develop a cost estimate for the DDP to the level of detail necessary for a decision. The DDP package will then be taken to the appropriate program level IPT/AIT Team Leader. At the conclusion of this precoordination phase, the PCM will be developed and put into the formal change processing system.

N.2.2 SPACE STATION CHANGE MEMO

All proposed changes will be defined utilizing the Space Station, Change Memo form. The forms and detailed instructions for completion are contained in Appendix C, Attachment A of this Handbook. CSA will provide a draft PCM with the following information prior to submittal to the appropriate IPT/AIT for approval:

a. Draft "From/To" language for impacted baselined documentation

b. Other potentially impacted baselined documentation

c. Cost estimate

d. Summary description of change

e. Reason for change/background summary

N.2.3 PCM DISTRIBUTION

PCMs will be vaulted in PALS. The NASA CM Receipt Desk will electronically notify the CSA CM Receipt Desk of the PALS location of the PCM. A hardcopy of the PCM will be delivered to the CSA Houston Liaison Office as a backup.

N.3 PROGRAM LEVEL CHANGE NUMBERING

All proposed program level changes entered into the formal change processing system will be assigned an SSCN by the Prime Contractor at NASA/JSC. These numbers will be assigned sequentially, regardless of who initiates the change. A log identifying the change processing number, initiator, change title, Prime Point of Contact, Change Engineer, CM Change Integrator, and change disposition will be maintained by the Prime.

Example: SSCN — SSCN 00000l through SSCN 999999

N.3.1 TECHNICAL APPROVAL

The PCM will be forwarded to the appropriate level IPT/AIT for technical approval. If disapproved, it will be so noted on the PCM, filed, and CSA will be notified. If CSA takes exception with the disposition, they can resubmit the PCM directly to the SSCB. If approved, the PCM will be signed by the IPT/AIT Team Leader and an overall program change process strategy developed including the following:

a. Assignment of a Prime ECP/PCP/TCP change number

b. Identification of the Change Integrator if not already assigned

c. Identification of affected Prime/PG IPT/AITs, other International Partners, and NASA organizations

d. Establishment of the distribution list of the PCM

e. Determination of the urgency of the change (i.e., does the change require immediate implementation?)

f. Determination of whether a ROM or NTE cost estimate is required

g. Identification of impacts to configuration–controlled documentation

h. Identification of draft preliminary change processing schedule for Change Planning Meeting

N.3.2 DEVELOP CHANGE EVALUATIONS

Upon receipt of a PCM, CSA is responsible for expeditiously reviewing, assessing impact, and providing a Change Evaluation to the Change Engineer/Change Integrator. The Change Evaluation form and instructions for its completion are contained in Appendix C, Attachment C and are in each PCM package that is distributed for review. The completed Change Evaluation will be submitted to NASA/JSC through the CM Receipt Desk.

N.4 CHANGE DIRECTIVE DEVELOPMENT

The CD is the official document used by the ISSA Program to disposition a NASA/IP baseline change and is the sole authority for changing the NASA/IP formal Space Station configuration baselines. The CD may include instructions/actions for change implementation, funding requirements, schedule milestone requirements, Space Station allocation, and implementation effectivity. The CD form and instructions for completion are contained in Appendix C, Attachment D–1.

N.4.1 CHANGE DIRECTIVE PREPARATION/COORDINATION

A CD shall be written, after DDP approval and prior to preparation of a PCM, if the ISSA Prime Contractor is affected. This directive will authorize the Prime to prepare a proposal (Firm/NTE) and may implement the change between the Prime and NASA. When CSA is required to implement the change, after DDP approval and prior to the preparation of a PCM, the CD shall also require CSA signature.

The CD will be revised through coordination with the CSA Change Initiator, Change Engineer and Change Integrator as part of the Impact Assessment/Change Packaging phase of the process. The CD will reflect the proposal being approved, and will be ready for signature upon disposition. The draft directive will be distributed for coordination by all affected parties prior to the meeting at which it will be dispositioned.

N.4.2 DISPOSITION

Upon disposition of the proposal, the Change Integrator will present the CD at the Board, modifying it by redlining to include any modifications authorized by the Board decision. The

Change Integrator will obtain the necessary signatures and electronically transmit the completed form (and attachments) and the CD distribution list to the ERU. The Change Integrator will also concurrently submit to ERU the original hardcopy.

N.4.3 DISTRIBUTION

The Change Integrator will perform hardcopy distribution. The ERU will upload the CD into the PALS. ERU will notify all CM Receipt Desks of the CD location in PALS. ERU will then file the original hardcopy in the CM Master Change File.

N.5 CONFIGURATION MANAGEMENT RECEIPT DESK ACCOUNTS

An electronic CM Receipt Desk account has been established for all Program Participants for the official receipt and transmittal of change–related data. The CSA CM Receipt Desk has been established and is named CM Receipt CSA. The point of contact for CSA has also been established.

N.6 DOCUMENTATION MAINTENANCE

When changes to a CSA/NASA bilateral document have been approved by the SSCB or its delegated authority, these changes will be forwarded to the CSA Confiiguration Management Office (CMO) for incorporation into the bilateral documents. These baselined bilateral documents will be maintained by the CSA CMO. After the approved change(s) have been incorporated into the document(s), maintained by the CSA, the CSA CMO will provide an Interleaf copy through PALS to the NASA CMO for formal distribution.

(This page reserved)

**APPENDIX O EUROPEAN SPACE AGENCY CONFIGURATION MANAGEMENT
PROCESS/INTERFACE**

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NOTE: The ESA Configuration Management Process, Appendix O, is a draft subject to final agreement between ESA and NASA.

O.1 PURPOSE

This appendix defines and establishes a change process that provides the means and authority for the initiation, processing, approval, and incorporation of changes. Characteristics of this change process include the following: using a common change form; implementing a common process to define and evaluate all technical and schedule impacts; coordination between NASA and ESA; and placing an emphasis on the IPT/AIT which provides processing and disposition of changes at the lowest level possible. The ESA IPT/AIT functions are delegated to the Columbus Engineering Board (EB). ESA will utilize their IPT/AIT (EB) and existing configuration control methods within their Agency, but will utilize the ISSA PCM/CCM as documented in Attachment A to Appendix C for processing changes to the Program. Changes will be precoordinated and provided to the appropriate program level IPT/AIT for processing in accordance with Figure TBD.

O.1.1 SCOPE

This Appendix describes the Configuration Management interfaces between NASA and ESA, which includes the maintenance and control of Bilateral and Multilateral documents. Affected lower–level documents shall not be covered by ESA/NASA PCM's.

O.2 CHANGE PROCESS STEPS

The ISSA change process will be used to support the development of all changes on the Program. Target processing flow times for each change classification are provided in Table TBD. However, flow times may vary from these targets based upon the complexity of the change, NASA/prime management direction, the number of changes currently in process, or the urgency of the change. The Change Engineer will determine the specific response time for each change action.

O.2.1 TECHNICAL EVALUATION/PRECOORDINATION PHASE

This phase is intended to provide the ESA and other program participants with a method to get proposed changes reviewed and into the formal change process. As unresolved issues are reviewed by the appropriate program level IPT/AIT and determined to have a technical impact on the Prime/PGs, International Partners, and NASA program participants, a DDP will be developed to define the proposed changes to the program baselines. The DDP will be precoordinated with other affected prime IPTs/AITs, PGs, NASA organizations, and International Partners using the process defined in Figure TBD. This will be accomplished prior to submittal of the DDP for review and disposition, and prior to formal processing. A NASA and ESA co–Change Engineer will be assigned by the IPT/AIT, which is initiating the change. The co–Change Engineer shall coordinate the DDP accordingly. The DDP package will then be taken to the appropriate program level IPT/AIT Team Leader. At the conclusion of this

precoordination phase, the PCM will be developed and put into the formal change processing system. When a DDP is approved where ESA is affected, the DDP shall be transmitted to ESA for status and tracking purposes.

O.2.2 SPACE STATION CHANGE MEMO

All proposed changes will be defined utilizing the Space Station, Change Memo form. The forms and detailed instructions for completion are contained in Attachment A to Appendix C, of this Handbook. ESA will complete the PCM with the following information minimum information prior to submittal to the appropriate IPT/AIT for approval:

a. Name of NASA and ESA co–Change Engineer and his signature on the PCM

b. A SSCN number, assigned by the Prime CM Team

c. Identification of affected International Partners, NASA organizations, Prime Contractor

d. Schedule estimates from all impacted Program Participants

e. Identification of impacts to configuration–controlled documents/items

f. Draft "From/To" language for impacted baselined documentation or complete draft document in case of major update where the From/To text is cumbersome

g. Determination of the urgency of the change (require immediate implementation)

h. Summary description of change

i. Reason for change/background summary

j. Establishment of the distribution list of the PCM

O.2.2.1 PCM PROVIDED BY ESA

ESA has the right to provide a PCM for major change(s) to program baselined, bilateral, and multilateral documents.

O.2.3 PCM DISTRIBUTION

PCMs will be vaulted in PALS. The NASA CM Receipt Desk will electronically notify the ESA CM Receipt Desk of the PALS location of the PCM. A hardcopy of the PCM will be delivered to the ESA CMO in The Netherlands and to the ESA Houston Liaison Office as a backup.

O.3 PROGRAM LEVEL CHANGE NUMBERING

All proposed program level changes entered into formal change processing system will be assigned an SSCN by the Prime Contractor at NASA/JSC. These numbers will be assigned sequentially, regardless of who initiates the change. A log identifying the change processing number, initiator, change title, co–Change Engineers, CM Change Integrator, and change disposition will be maintained by the Prime.

Example: SSCN — SSCN 00000l through SSCN 999999

O.3.1 TECHNICAL APPROVAL

The PCM will be forwarded to the appropriate level IPT/AIT for technical approval. If disapproved, it will be so noted on the PCM, filed, and ESA will be notified. If ESA takes exception with the disposition, they can resubmit the change directly to the SSCB.

O.3.2 DEVELOP CHANGE EVALUATIONS

Upon receipt of a PCM, ESA is responsible for expeditiously reviewing, assessing impact and providing a Change Evaluation to the Change Engineer/Change Integrator. The Change Evaluation form and instructions for its completion are contained in Attachment C to Appendix C of this handbook, and are in each PCM package that is distributed for review. The completed Change Evaluation will be submitted to NASA/JSC through the CM Receipt Desk. Where ESA is a co–Change Engineer, the NASA/JSC CM Receipt Desk shall provide a copy of the received Change Evaluations(s) to the ESA CM Receipt Desk.

O.4 CHANGE DIRECTIVE DEVELOPMENT

The CD is the official document used by the ISSA Program to disposition a Program baseline change and is the sole authority for changing the formal Space Station configuration baselines. The CD may include instructions/actions for change implementation, requirements, schedule milestone requirements, Space Station allocation, and implementation effectivity. The CD form and instructions for completion are contained in Attachment D–1 to Appendix C of this handbook.

O.4.1 CHANGE DIRECTIVE PREPARATION/COORDINATION

A CD shall be written, after DDP approval and prior to preparation of a PCM, if the ISSA Prime Contractor is affected. This directive will authorize the Prime to prepare a proposal (Firm/NTE) and may implement the change between the Prime and NASA. When ESA is required to implement the change, after DDP approval and prior to the preparation of a PCM, the CD shall also require ESA signature.

The CD will be revised through coordination with the ESA Change Initiator, Change Engineer and Change Integrator as part of the Impact Assessment/Change Packaging phase of the process. The CD will reflect the proposal being approved, and will be ready for signature upon disposition. The draft directive will be distributed for coordination by all affected parties prior to the meeting at which it will be dispositioned.

O.4.2 DISPOSITION

Upon disposition of the proposal, the Change Integrator will complete the CD, modifying it to reflect board decisions, including any modifications authorized. He will obtain the necessary

signatures and electronically transmit the completed form (and attachments) and the CD distribution list to the ERU.

O.4.2.1 APPROVED CHANGE DIRECTIVES

When an approved CD is affecting a ESA configuration–controlled item(s), ESA is responsible for directing their Contractor to implement the change into the ESA program baseline. The following ESA change process will be used for implementation of the change:

a.   Prepare Engineering Change Request

b.   ECR reviewed at Engineering Board

c.   ECR dispositioned by Columbus Change Board

d.   Transmit ECR to Contractor

e.   Contractor submit Contractors Change Notice

f.   CCN disposition by the CCB

g.   Provide CCN status to NASA

O.4.2.2 AGENCY–TO–AGENCY APPROVAL

This paragraph remains an issue and is subject to additional discussion.

O.4.3 DISTRIBUTION

The Change Integrator will perform hardcopy distribution. The ERU will upload the CD into the PALS. ERU will notify all CM Receipt Desks of the CD location in PALS. The original hardcopy will be retained in the Program CM Master Change File.

O.4.3.1 NASA STATUS REPORTS

TBD

O.5 CONFIGURATION MANAGEMENT RECEIPT DESK ACCOUNTS

An electronic CM Receipt Desk account has been established for all Program Participants for the official receipt and transmittal of change–related data. The ESA CM Receipt Desk has been established and is named CM Receipt ESA. The point of contact for ESA has also been established.

O.6 DOCUMENTATION MAINTENANCE

When changes to a bilateral or multilateral document, for which ESA is the signatory, have been approved by the SSCB or its delegated authority, these changes will be forwarded to the

ESA/Columbus CMO for incorporation into the bilateral or multilateral documents. These baselined bilateral or multilateral documents will be maintained by the ESA CMO. After the approved change(s) have been incorporated into the document(s), maintained by the ESA, ESA CMO will provide an Interleaf copy, with Release Order, through the ERU to PALS for formal distribution.

APPENDIX P NATIONAL SPACE DEVELOPMENT AGENCY OF JAPAN CONFIGURATION MANAGEMENT PROCESS/INTERFACE

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NOTE: The NASDA Configuration Management Process, Appendix P, is a draft subject to final agreement between NASDA and NASA.

P.1 PURPOSE

This appendix defines and establishes an integrated change process that provides the means and authority for the initiation, processing, approval, and incorporation of changes. Characteristics of this integrated change process include the following: using a common change form; implementing a common process to define and evaluate all technical, cost, and schedule impacts; coordination between NASA and NASDA; and placing an emphasis on the IPT/AIT which provides processing and disposition of changes at the lowest level possible. NASDA will utilize their existing configuration control methods within their Agency, but will utilize the ISSA PCM/CCM as documented in Attachment A to Appendix C for processing changes to the Program. Changes will be precoordinated and provided to the appropriate program level IPT/AIT for processing in accordance with Figure C–1.

P.1.1 SCOPE

The scope of the NASA/NASDA Configuration Management interface will include the control and maintenance of NASA/NASDA bilateral and multilateral documents by the NASA CMO.

P.2 CHANGE PROCESS STEPS

The ISSA integrated change process will be used to support the development of all changes on the Program. Target processing flow times for each change classification are provided in Table C–1. However, flow times may vary from these targets based upon the complexity of the change, NASA/prime management direction, the number of changes currently in process, or the urgency of the change. The Change Engineer will determine the specific response time for each change action.

P.2.1 TECHNICAL EVALUATION/PRECOORDINATION PHASE

This phase is intended to provide the NASDA and other program participants with a method to get proposed changes reviewed and into the formal change process. As unresolved issues are reviewed by the appropriate program level IPT/AIT and determined to have a cost schedule or technical impact on the Prime/PGs, International Partners, and NASA program participants, a DDP will be developed to define the proposed changes to the technical/contract baselines. The DDP will be precoordinated with other affected prime IPTs/AITs, PGs, NASA organizations, and International Partners using the process defined in Figure C–1. This will be accomplished prior to submittal of the DDP for review and disposition, and prior to formal processing. Earlier involvement in the change process can be achieved though participation in the VAIT/VIPT. A Change Engineer will be assigned by NASA. The Change Engineer, with support from the NASA Finance organization, as required, will develop a cost estimate for the DDP to the level of detail necessary for a decision. The DDP package will then be taken to the appropriate program level IPT/AIT Team Leader. At the conclusion of this precoordination phase, the PCM will be developed and put into the formal change processing system.

P.2.2 SPACE STATION CHANGE MEMO

All proposed changes will be defined utilizing the Space Station, Change Memo form. The forms and detailed instructions for completion are contained in Appendix C, Attachment A of this Handbook. NASDA will provide a draft PCM with the following information prior to submittal to the appropriate IPT/AIT for approval:

a. Draft "From/To" language for impacted baselined documentation

b. Other potentially impacted baselined documentation

c. Cost estimate

d. Summary description of change

e. Reason for change/background summary

P.2.3 PCM DISTRIBUTION

PCMs will be vaulted in PALS. The NASA CM Receipt Desk will electronically notify the NASDA CM Receipt Desk of the PALS location of the PCM. A hardcopy of the PCM will be delivered to the NASDA Houston Liaison Office as a backup.

P.3 PROGRAM LEVEL CHANGE NUMBERING

All proposed program level changes entered into the formal change processing system will be assigned an SSCN by the Prime Contractor at NASA/JSC. These numbers will be assigned sequentially, regardless of who initiates the change. A log identifying the change processing number, initiator, change title, Prime Point of Contact, Change Engineer, CM Change Integrator, and change disposition will be maintained by the Prime.

Example: SSCN — SSCN 00000l through SSCN 999999

P.3.1 TECHNICAL APPROVAL

 The PCM will be forwarded to the appropriate level IPT/AIT for technical approval. If disapproved, it will be so noted on the PCM, filed, and NASDA will be notified. If NASDA takes exception with the disposition, they can resubmit the PCM directly to the SSCB. If approved, the PCM will be signed by the IPT/AIT Team Leader and an overall program change process strategy developed including the following:

a. Assignment of a Prime ECP/PCP/TCP change number

b. Identification of the Change Integrator if not already assigned

c. Identification of affected Prime/PG IPT/AITs, other International Partners, and NASA organizations

d. Establishment of the distribution list of the PCM

e. Determination of the urgency of the change (i.e., does the change require immediate implementation?)

f. Determination of whether a ROM or NTE cost estimate is required

g. Identification of impacts to configuration–controlled documentation

h. Identification of draft preliminary change processing schedule for Change Planning Meeting

P.3.2 DEVELOP CHANGE EVALUATIONS

Upon receipt of a PCM, NASDA is responsible for expeditiously reviewing, assessing impact, and providing a Change Evaluation to the Change Engineer/Change Integrator. The Change Evaluation form and instructions for its completion are contained in Appendix C, Attachment C and are in each PCM package that is distributed for review. The completed Change Evaluation will be submitted to NASA/JSC through the CM Receipt Desk.

P.4 CHANGE DIRECTIVE DEVELOPMENT

The CD is the official document used by the ISSA Program to disposition a NASA/IP baseline change and is the sole authority for changing the NASA/IP formal Space Station configuration baselines. The CD may include instructions/actions for change implementation, funding requirements, schedule milestone requirements, Space Station allocation, and implementation effectivity. The CD form and instructions for completion are contained in Appendix C, Attachment D–1.

P.4.1 CHANGE DIRECTIVE PREPARATION/COORDINATION

A CD shall be written, after DDP approval and prior to preparation of a PCM, if the ISSA Prime Contractor is affected. This directive will authorize the Prime to prepare a proposal (Firm/NTE) and may implement the change between the Prime and NASA. When NASDA is required to implement the change, after DDP approval and prior to the preparation of a PCM, the CD shall also require NASDA signature.

The CD will be revised through coordination with the NASDA Change Initiator, Change Engineer and Change Integrator as part of the Impact Assessment/Change Packaging phase of the process. The CD will reflect the proposal being approved, and will be ready for signature upon disposition. The draft directive will be distributed for coordination by all affected parties prior to the meeting at which it will be dispositioned.

P.4.2 DISPOSITION

Upon disposition of the proposal, the Change Integrator will present the CD at the Board, modifying it by redlining to include any modifications authorized by the Board decision. He

will obtain the necessary signatures and electronically transmit the completed form (and attachments) and the CD distribution list to the ERU. The Change Integrator will also concurrently submit to ERU the original hardcopy.

P.4.3 DISTRIBUTION

The Change Integrator will perform hardcopy distribution. The ERU will upload the CD into the PALS. ERU will notify all CM Receipt Desks of the CD location in PALS. ERU will then file the original hardcopy in the CM Master Change File.

P.5 CONFIGURATION MANAGEMENT RECEIPT DESK ACCOUNTS

An electronic CM Receipt Desk account has been established for all Program Participants for the official receipt and transmittal of change–related data. The NASDA CM Receipt Desk has been established and is named NASDA CM Receipt. The point of contact for NASDA has also been established.

P.6 DOCUMENTATION MAINTENANCE

When changes to a NASDA/NASA bilateral document has been approved by the SSCB or its delegated authority, these changes will be forwarded to the NASA CMO for incorporation into the bilateral documents. These baselined bilateral documents will be maintained by the NASA CMO. After the approved change(s) have been incorporated into the document(s), NASA CMO will provide an Interleaf copy through PALS to NASDA and be responsible for formal distribution to other Program Participants.

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APPENDIX Q ITALIAN SPACE AGENCY CONFIGURATION MANAGEMENT PROCESS/INTERFACE

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NOTE: The ASI Configuration Management Process, Appendix Q, is a draft subject to final agreement between ASI and NASA.

Q.1 PURPOSE

This appendix defines and establishes a change process that provides the means and authority for the initiation, processing, approval, and incorporation of changes. Characteristics of this change process include the following: using a common change form; implementing a common process to define and evaluate all technical and schedule impacts; coordination between NASA and ASI; and placing an emphasis on the IPT/AIT which provides processing and disposition of changes at the lowest level possible. The ASI IPT/AIT functions are delegated to the Columbus Engineering Board (EB). ASI will utilize their IPT/AIT (EB) and existing configuration control methods within their Agency, but will utilize the ISSA PCM/CCM as documented in Attachment A to Appendix C for processing changes to the Program. Changes will be precoordinated and provided to the appropriate program level IPT/AIT for processing in accordance with Figure TBD.

Q.1.1 SCOPE

This Appendix describes the Configuration Management interfaces between NASA and ASI, which includes the maintenance and control of Bilateral and Multilateral documents. Affected lower–level documents shall not be covered by ASI/NASA PCM's.

Q.2 CHANGE PROCESS STEPS

The ISSA change process will be used to support the development of all changes on the Program. Target processing flow times for each change classification are provided in Table TBD. However, flow times may vary from these targets based upon the complexity of the change, NASA/prime management direction, the number of changes currently in process, or the urgency of the change. The Change Engineer will determine the specific response time for each change action.

Q.2.1 TECHNICAL EVALUATION/PRECOORDINATION PHASE

This phase is intended to provide the ASI and other program participants with a method to get proposed changes reviewed and into the formal change process. As unresolved issues are reviewed by the appropriate program level IPT/AIT and determined to have a technical impact on the Prime/PGs, International Partners, and NASA program participants, a DDP will be developed to define the proposed changes to the program baselines. The DDP will be precoordinated with other affected prime IPTs/AITs, PGs, NASA organizations, and International Partners using the process defined in Figure TBD. This will be accomplished prior to submittal of the DDP for review and disposition, and prior to formal processing. An NASA and ASI co–Change Engineer will be assigned by the IPT/AIT, which is initiating the change. The co–Change Engineer shall coordinate the DDP accordingly. The DDP package will then be taken to the appropriate program level IPT/AIT Team Leader. At the conclusion of this

precoordination phase, the PCM will be developed and put into the formal change processing system. When a DDP is approved where ASI is affected, the DDP shall be transmitted to ASI for status and tracking purposes.

Q.2.2 SPACE STATION CHANGE MEMO

All proposed changes will be defined utilizing the Space Station Change Memo form. The forms and detailed instructions for completion are contained in Attachment A to Appendix C, of this Handbook. ASI will complete the PCM with the following information minimum information prior to submittal to the appropriate IPT/AIT for approval:

a. Name of NASA and ASI co–Change Engineer and his signature on the PCM

b. An SSCN number, assigned by the Prime CM Team

c. Identification of affected International Partners, NASA organizations, Prime Contractor

d. Schedule estimates from all impacted Program Participants

e. Identification of impacts to configuration–controlled documents/items

f. Draft "From/To" language for impacted baselined documentation or complete draft document in case of major update where the From/To text is cumbersome

g. Determination of the urgency of the change (require immediate implementation)

h. Summary description of change

i. Reason for change/background summary

j. Establishment of the distribution list of the PCM

Q.2.2.1 PCM PROVIDED BY ASI

ASI has the right to provide a PCM for major change(s) to program baselined, bilateral, and multilateral documents.

Q.2.3 PCM DISTRIBUTION

PCMs will be vaulted in PALS. The NASA CM Receipt Desk will electronically notify the ASI CM Receipt Desk of the PALS location of the PCM. A hardcopy of the PCM will be delivered to the ASI CMO in The Netherlands and to the ASI Houston Liaison Office as a backup.

Q.3 PROGRAM LEVEL CHANGE NUMBERING

All proposed program level changes entered into formal change processing system will be assigned an SSCN by the Prime Contractor at NASA/JSC. These numbers will be assigned sequentially, regardless of who initiates the change. A log identifying the change processing number, initiator, change title, co–Change Engineers, CM Change Integrator, and change disposition will be maintained by the Prime.

Example: SSCN — SSCN 00000l through SSCN 999999

Q.3.1 TECHNICAL APPROVAL

The PCM will be forwarded to the appropriate level IPT/AIT for technical approval. If disapproved, it will be so noted on the PCM, filed, and ASI will be notified. If ASI takes exception with the disposition, they can resubmit the change directly to the SSCB.

Q.3.2 DEVELOP CHANGE EVALUATIONS

Upon receipt of a PCM, ASI is responsible for expeditiously reviewing, assessing impact and providing a Change Evaluation to the Change Engineer/Change Integrator. The Change Evaluation form and instructions for its completion are contained in Attachment C to Appendix C of this handbook, and are in each PCM package that is distributed for review. The completed Change Evaluation will be submitted to NASA/JSC through the CM Receipt Desk. Where ASI is a co–Change Engineer, the NASA/JSC CM Receipt Desk shall provide a copy of the received Change Evaluations(s) to the ASI CM Receipt Desk.

Q.4 CHANGE DIRECTIVE DEVELOPMENT

The CD is the official document used by the ISSA Program to disposition a Program baseline change and is the sole authority for changing the formal Space Station configuration baselines. The CD may include instructions/actions for change implementation, requirements, schedule milestone requirements, Space Station allocation, and implementation effectivity. The CD form and instructions for completion are contained in Attachment D–1 to Appendix C of this handbook.

Q.4.1 CHANGE DIRECTIVE PREPARATION/COORDINATION

A CD shall be written, after DDP approval and prior to preparation of a PCM, if the ISSA Prime Contractor is affected. This directive will authorize the Prime to prepare a proposal (Firm/NTE) and may implement the change between the Prime and NASA. When ASI is required to implement the change, after DDP approval and prior to the preparation of a PCM, the CD shall also require ASI signature.

The CD will be revised through coordination with the ASI Change Initiator, Change Engineer and Change Integrator as part of the Impact Assessment/Change Packaging phase of the process. The CD will reflect the proposal being approved, and will be ready for signature upon disposition. The draft directive will be distributed for coordination by all affected parties prior to the meeting at which it will be dispositioned.

Q.4.2 DISPOSITION

Upon disposition of the proposal, the Change Integrator will complete the CD, modifying it to reflect board decisions, including any modifications authorized. He will obtain the necessary

signatures and electronically transmit the completed form (and attachments) and the CD distribution list to the ERU.

Q.4.2.1 APPROVED CHANGE DIRECTIVES

When an approved CD is affecting an ASI configuration–controlled item(s), ASI is responsible for directing their Contractor to implement the change into the ASI program baseline. The following ASI change process will be used for implementation of the change:

a. Prepare Engineering Change Request

b. ECR reviewed at Engineering Board

c. ECR dispositioned by Columbus Change Board

d. Transmit ECR to Contractor

e. Contractor submit Contractors Change Notice

f. CCN disposition by the CCB

g. Provide CCN status to NASA

Q.4.2.2 AGENCY–TO–AGENCY APPROVAL

This paragraph remains an issue and is subject to additional discussion.

Q.4.3 DISTRIBUTION

The Change Integrator will perform hardcopy distribution. The ERU will upload the CD into the PALS. ERU will notify all CM Receipt Desks of the CD location in PALS. The original hardcopy will be retained in the Program CM Master Change File.

Q.4.3.1 NASA STATUS REPORTS

TBD

Q.5 CONFIGURATION MANAGEMENT RECEIPT DESK ACCOUNTS

An electronic CM Receipt Desk account has been established for all Program Participants for the official receipt and transmittal of change–related data. The ASI CM Receipt Desk has been established and is named CM Receipt ASI. The point of contact for ASI has also been established.

Q.6 DOCUMENTATION MAINTENANCE

When changes to a bilateral or multilateral document, for which ASI is the signatory, have been approved by the SSCB or its delegated authority, these changes will be forwarded to the

ASI/Columbus CMO for incorporation into the bilateral or multilateral documents. These baselined bilateral or multilateral documents will be maintained by the ASI CMO. After the approved change(s) have been incorporated into the document(s), maintained by the ASI, ASI CMO will provide an Interleaf copy, with Release Order, through the ERU to PALS for formal distribution.

Q.7 TBD

APPENDIX R RUSSIAN SPACE AGENCY CONFIGURATION MANAGEMENT PROCESS/INTERFACE

R.1 TBD

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APPENDIX S ISS CHANGE PROCESS FOR PHASE 1 OF THE RSA CONTRACT

7 MARCH 1995

PREPARED BY: /s/Dave Lengyel   Project Manager, ISS
                   D. Lengyel   Russian Program Phase 1

CHECKED BY: /s/A. C. Bond   Co–Team Lead, ISS
                   A. Bond   Configuration Management AIT

APPROVED BY: /a/J. Nise   Manager, ISS
                   J. Nise   Russian Programs – Phase 1

APPROVED BY: /s/T. W. Holloway   Program Manager,
                   T. Holloway   Phase One

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FIGURES

S.1 PURPOSE

Appendix S defines and establishes an integrated change process that provides the means and authority to initiate, process, approve, and incorporate all changes to Contract NAS15–10110 between NASA and the Russian Space Agency (RSA). This contract consists of a number of inter–related projects for Phase One activities which are intended to result in: Mir Orbital Station lifetime extension; Mir capabilities expansion, mission support activities for both Shuttle docking missions to Mir and U.S. astronaut long–duration stay time aboard Mir. Phase Two supplies and services are excluded from this change process. Because of the unique nature of this contract, a tailored approach to configuration management and contract changes has been established.

S.2 PHASE 1 INTEGRATED CHANGE PROCESS FLOW

The Phase One integrated change process will be used to support the development of all Contract NAS15–10110 changes which do not impact Phase 2 activities, the ISS prime contract and/or product groups. Changes which do impact either Phase 2, the prime contractor, or product groups, will be referred to the ISS integrated change process discussed in Section C and Appendix R of this handbook. Figure S–1 and the following subparagraphs describe the steps applicable to each type of Phase One change activity. Target processing flow times for each change classification, are provided in Table S–1.

S.2.1 CHANGE CATEGORIES DEFINITION

S.2.1.1 NASA INITIATED CHANGE

NASA initiated changes are changes originating from the Phase One Joint Technical Working Groups (JTWGs), the ISS IPTs/AITs or the Contracting Officer's Technical Representative (COTR) which impact Contract NAS15–10110. These changes will be processed using the process depicted in Figure S–1.

S.2.1.2 RUSSIAN SPACE AGENCY (RSA) INITIATED CHANGE

RSA initiated changes are changes originating from the Russian Phase One Joint Technical Working Groups which impact Contract NAS15–10110. Russian JTWG or RSA proposed contract changes may be documented on the PCM form or on a joint protocol and will be precoordinated with the appropriate NASA JTWGs/IPTs/AITs for processing in accordance with Figure S–1.
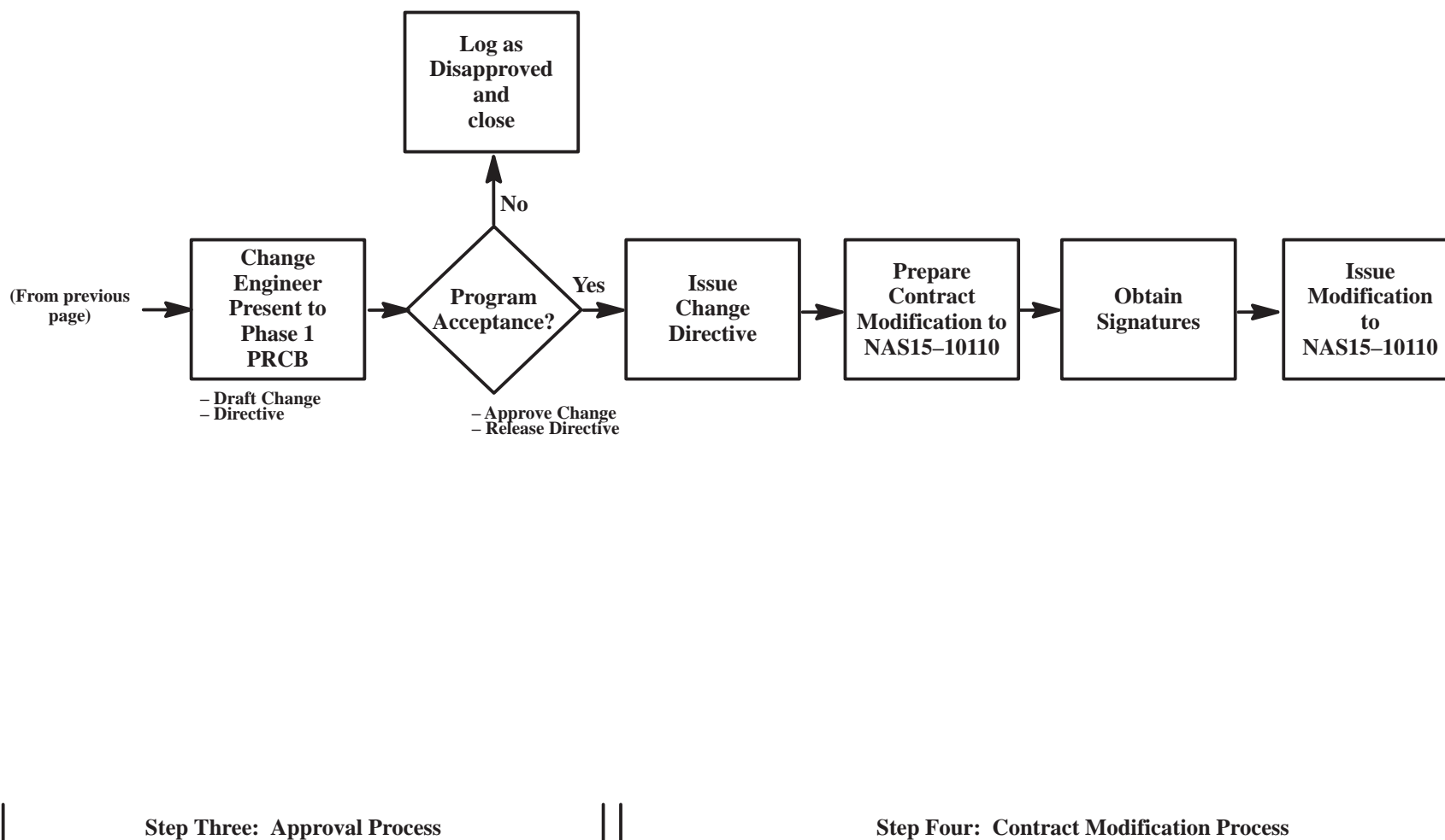
FIGURE S–1 PHASE ONE CHANGE PROCESSING

(From previous page)

Change Engineer Present to Phase 1 PRCB

– Draft Change
– Directive

Program Acceptance?

No

Log as Disapproved and close

– Approve Change
– Release Directive

Yes

Issue Change Directive

Prepare Contract Modification to NAS15–10110

Obtain Signatures

Issue Modification to NAS15–10110

Step Three: Approval Process

Step Four: Contract Modification Process

FIGURE S–1 PHASE ONE CHANGE PROCESSING (CONTINUED)

S.2.1.3 INTERNAL CHANGE

An internal change is a change to the JTWGs or the ISS IPTs/AITs controlled baseline data, or documents that are totally within the group's existing charter to modify, and with no technical, cost, or schedule impact to Contract NAS15–10110.

S.3 DETAILED ISS PHASE 1 INTEGRATED CHANGE PROCESS FLOW

The Phase One Integrated Change Process is divided into the following four steps:

— Step One. Issue Process: The need for a change is developed within a NASA or Russian Joint Technical Working Group and/or ISS IPT/AIT. A technical representative from the affected group will consult with the COTR to determine whether the change impacts Phase 2/ISS prime contractor or product groups. An issue visibility meeting will be scheduled, if required.

— Step Two. Coordination Process: The proposed change will be drafted and precoordinated by the assigned Change Engineer. If the change results in a positive cost impact to the contract, the COTR, CO, and Phase One Program Manager (POPM) will work with RSA to ensure the technical/schedule change results in zero net cost impact. Trades involving technical content addition or deletion may be conducted. Cost savings will be placed in a management reserve. A Change Integrator from the Configuration Management AIT will be assigned after cost reconciliation to coordinate the formal change process. The PCM will be distributed with Change Evaluation forms to all impacted JTWGs, IPTs/AITs to include Russian JTWGs. Inputs will be collected and a CCM will be drafted by the Change Integrator.

— Step Three. Approval Process: When the formal review is complete, the CCM will be presented to the Phase One Program Requirements Review Board by the Change Engineer for program disposition. If approved, the change will be submitted to the CO for contract modification.

— Step Four. Contract Modification Process: This step includes the Change Implementation and Contract Definitization process. The Contracting Officer will coordinate activities at NASA and RSA in this step to result in the final contract change.

The following paragraphs further define the requirements for these process steps.

S.3.1 STEP ONE: ISSUE PROCESS

S.3.1.1 ISSUE/NON–ISSUE DETERMINATION

A contract change may involve cross discipline, technical, schedule, and/or cost changes. The affected JTWG and/or ISS IPT/AIT must determine with the assistance of the COTR whether or not the issue requires a visibility meeting or is not significant enough to be raised to the

management level before precoordination. In the latter case, the change is considered a "non–issue".

S.3.1.2 PHASE 2, PRIME OR PRODUCT GROUP IMPACT DETERMINATION

After the need for change has been determined by one of the JTWGs, an ISS IPT/AIT, or the RSA, the CO and COTR will be notified. A determination will be made whether the change impacts either Phase 2, the ISS prime contractor or one of the product groups. If the change impacts one of these areas, further processing of the change will be accomplished via the normal ISS CM channels.

S.3.1.3 CONDUCT ISSUE VISIBILITY MEETING

For issues requiring cross discipline changes to the contract, an issue visibility meeting will be scheduled. The issue visibility meeting may be held in conjunction with Phase One Management Group (POMG) or Shuttle–Mir Tagups. The affected JTWG or ISS IPT/AIT technical representative shall discuss the need for the proposed change, technical areas impacted, schedule impact, and cost impact, if known. At the visibility meeting, the technical representative will delineate a proposed timetable in which the change should be processed.

S.3.2 STEP TWO: COORDINATION PROCESS

S.3.2.1 DRAFT/PRECOORDINATE PRELIMINARY CHANGE MEMO (PCM)

Phase One changes will be assigned a Change Engineer from the cognizant JTWG or ISS IPT/AIT. The Change Engineer will compose a first draft of a PCM with COTR assistance if required. The PCM will be coordinated within the JTWGs, cognizant ISS IPTs/AITs via hard copy. Refer to Table S–1 for estimated flow time. It is the responsibility of the Change Engineer to collect as much data as possible to define the overall scope of the change during this process. The precoordinated PCM will be forwarded to the COTR to determine if a cost impact exists to the contract. All changes with a cost impact must be approved by the POPM. The following tasks will be completed in this phase:

— Name of Change Engineer assigned.

— Identification of affected JTWGs/IPTs.

— Technical inputs from the impacted JTWGs/IPTs/AITs.

— Schedule estimates from the impacted JTWGs/IPTsAITs.

— Cost impact (estimate).

TABLE S–1 PHASE ONE INTEGRATED CHANGE PROCESS FLOW TIMES

Process	Working Days
Step One: Issue Process	
COTR Determination	2 days
Issue Visibility Meeting	up to 5 days
Step Two: Coordination Process	
Draft/Precoordinate PCM	10 days
Cost Reconciliation/Trades	5 –10 days
Issue PCM and Consolidate Comments (RSA & NASA)	15 days
Step Three: Acceptance Process	
PRCB Disposition	up to 5 days
Step Four Contract Modification Process	
Issue Change Directive	5 days
Modify Contract	10 days

S.3.2.2 COST RECONCILIATION/TRADE DEVELOPMENT

The fully precoordinated PCM will be sent to the COTR to determine how a zero cost equitable adjustment to the contract may be accomplished (if required). The CO, COTR, and POPM will work with RSA and RSC Energia/Khrunichev/Gagarin Cosmonaut Training Center contracts representatives to ensure a zero cost or reduction in cost solution. This may be accomplished by making trades within line items of the contract. If a solution cannot be reached, the POPM must decide whether to develop alternative options or disapprove the change at this point. If a zero cost solution can be made, the PCM will be scheduled for full coordination by the Change Integrator. Cost savings generated by deletions of contract content will be placed in management reserve.

S.3.2.3 RECONCILIATION IMPACTS PHASE 2 OR PRIME

Because Contract NAS15–10110 contains both Phase One and Phase Two milestones, and an equitable adjustment to a Phase One milestone may impact Phase Two. Changes which are determined to impact Phase Two must be processed through the normal ISS CM flow separately. Contract changes which have costs which cannot be reconciled will be briefed to the POPM to consider alternative options or process the change outside the board and disapprove.

S.3.2.4 ISSUE PCM FOR FORMAL EVALUATION

The precoordinated PCM will be assigned to a Change Integrator (CI) from the ISS CM AIT. The Change Integrator, through the ISS CM Receipt Desk, will distribute the PCM to the impacted JTWGs and/or IPTs. The PCM issue process will include the following tasks:

— Identification of the Change Integrator.

— Establishment of the final distribution list of the PCM.

— Determine urgency of the change (will it require immediate implementation).

— Identification of impacts to configuration–controlled documents/items.

— Draft "From/To" language for Contract NAS15–10110 and any baselined documentation.

— Drafting of a preliminary change processing schedule for review at the bi–weekly Shuttle–Mir Tagup.

S.3.2.5 PROGRAM LEVEL CHANGE NUMBERING

All Phase One changes initiated by NASA or the RSA will be assigned an SSCN by the ISS prime contractor. Internal changes do not require a SSCN. Phase One change numbering and tracking utilizes CACTIS.

S.3.2.6 WORKING GROUPS/IPTS/AITS PREPARE CHANGE EVALUATIONS

Each proposed change will be reviewed and change evaluations developed by the appropriate JTWGs and ISS program–level IPT/AITs. The draft/precoordination effort conducted prior to the Joint Management Working Group technical approval should have collected most of the technical inputs to the PCM. Estimated process flow times are shown in Table S–1.

S.3.2.7 RSA PREPARES CHANGE EVALUATION

The CI, with assistance from the CO, will transmit the PCM and Evaluation Sheet to the RSA CM Manager. The PCM will be sent concurrently to the cognizant JTWGs in Russia. The Russians shall not exceed 15 working days to respond.

S.3.2.8 CHANGE ENGINEER CONSOLIDATE WORKING GROUP/IPT INPUTS AND PREPARE NON–PRIME CCM

Following receipt of the PCM and Technical Evaluation Sheet, each affected JTWG/IPT/AIT is responsible for providing evaluations, to the CE/CI. The JTWGs/IPTs/AITs will use the Change Evaluation form provided in Attachment C of this handbook. The CI will update the PCM. The PCM will become the Composite Change Memo, or CCM, after final coordination. All electronic CCM inputs will be addressed to the "CM RECEIPT DESK ISS".

S.3.3 STEP THREE: APPROVAL PROCESS

S.3.3.1 PHASE 1 PROGRAM REQUIREMENTS CONTROL BOARD (PRCB)

The Phase One PRCB is responsible for dispositioning Phase One contract changes. Upon disposition of the change, the CI will complete the Change Directive with assistance from the

CO. Approved changes will be sent back to the CO and COTR and will be revised into the Change Directive format for programmatic signatures by the CI. The Change Directive will be forwarded to RSA and cognizant contractor(s) for signature.

S.3.4 STEP FOUR: CONTRACT MODIFICATION PROCESS

S.3.4.1 CHANGE IMPLEMENTATION AND CONTRACT MODIFICATION ISSUANCE

Upon completion of the change directive signature cycle, the directive is forwarded to the ISS CO and a contract modification is prepared. After coordination with the Moscow Administrative Contracting Officer (ACO), the package is forwarded to the Moscow Liaison Office. The ACO delivers and explains the package to RSA. After RSA reviews and signs the modification, the modification is signed by the ACO and returned to the CO at ISS for distribution.

S.4 FUNCTIONAL RESPONSIBILITIES

Each of the following individuals/teams/organizations are responsible for performing the following actions:

S.4.1 CHANGE ENGINEER

The Change Engineer is empowered with the overall responsibility for the change proposal, functioning as the technical expert and the single point of contact for change preparation. This requires coordination with JTWGs, ISS IPTs/AITs, and functional organizations. The Change Engineer's tasks include, but are not limited to, the following:

— Precoordination of proposed changes.
— Development of proposed schedules.
— Drafting the PCM.
— Identification of affected JTWGs/IPTs/AITs/NASA and agencies.
— Identification of impacts to configuration controlled documents/items.
— Review and approval of implementation schedules.
— Development and approval of cost impacts.
— Review and approval of technical proposals.
— Review and provide inputs to the COTR for contract "from/to" language.
— Review, assessment, and consolidation of RSA and JTWG/IPT/AIT change evaluations.
— CCM review and approval.
— Development and presentation of the change package to the POMG for change disposition.

S.4.2 CHANGE INTEGRATOR

The Change Integrator (CI) will be responsible for supporting the Change Engineer in the development, submittal, and definitization of the change proposal. This requires coordination

with the JTWGs, IPTs/AITs, functional organizations and NASA organizations for support. The CI's tasks include, but are not limited to:

— Support classification of changes.

— Support determination of Phase 2 or ISS prime contractor impacts.

— Compile the PCM/CCM.

— Identification of affected JTWGs/IPTs/AITs/NASA and agencies.

— Support change presentation meetings.

— Establish and maintain change files.

— Prepare Change Directive

S.4.3 AFFECTED JOINT TECHNICAL WORKING GROUPS/ IPTS/AITS

Affected Joint Technical Working Groups, IPTs/AITs will perform the following:

— Coordinate with all functional disciplines that support the JTWG, IPT/AIT.

— Ensure that all cost estimates substantiation is commensurate with change classification and COTR's direction.

— Ensure all schedule commitment activity is coordinated with scheduling organization.

S.4.4 CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE

The Contracting Officer's Technical Representative's (COTR) tasks include:

— Determine whether the proposed change impacts the ISS prime contractor and/or Phase 2.

— Provide the ISS interface between the JTWGs and the ISS IPTs/AITs.

— Coordinate with the Change Engineer the cost impact of the proposed change.

— Coordinate with CO and POPM to effect a zero sum change to the contract, using trades if necessary.

— Receive, evaluate, negotiate, and definitize contract changes with the CO and RSA.

S.4.5 CONTRACTING OFFICER

The Contracting Officer's (for Contract NAS15–10110) tasks include:

— Review change for relevance to contract SOW.

— Review cost impact to contract with COTR.

— Develop "From/To" language.

— Monitor change process to ensure timely execution of change directive.

— Develop and issue contract modification.

— Coordinate activities with NASA Administrative Contracting Officer (ACO) Moscow.

S.4.6 PHASE ONE PROGRAM MANAGER

The Phase One Program Manager's tasks include:

— Review cost impact (if any) of precoordinated PCMs with COTR.
— Approve trades within contract to make changes zero sum (or less).
— Manage funds placed into "management reserve".

S.4.7 PHASE ONE PROGRAM REQUIREMENTS CONTROL BOARD

The Phase One Program Requirements Control Board's tasks include:

— Reviewing Consolidated Change Memo (CCM).
— Dispositioning the CCM (approval/approval with changes/disapproval).

S.4.8 ISS CONFIGURATION MANAGEMENT RECEIPT DESK

The CM Receipt Desk will:

— Make electronic mail notification of PALS upload of all changes and change–related data between the Phase One Program Office, ISS Program Office and ISS Prime; and electronic and/or hard copy distribution to the JTWGs/IPTs/AITs and RSA, as specified in MOAs and task agreements.
— Serve as the receipt point for all official change–related submissions from the Joint Technical Working Groups and RSA.
— Provide the appropriate Change Integrator with electronic copies of all change–related submissions received from the JTWGs/IPTs/AITs and RSA when the electronic change evaluation is used.

S.4.8.1 ISS CONFIGURATION MANAGEMENT RECEIPT DESK ACCOUNTS

An electronic CM Receipt Desk account has been established for each NASA organization participant for the official receipt and transmittal of change–related data. A RSA CM Receipt Desk will be established in the future.

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APPENDIX T MEMORANDUM OF UNDERSTANDING BETWEEN THE INTERNATIONAL SPACE STATION PROGRAM CONFIGURATION MANAGEMENT OFFICE AND THE SPACE SHUTTLE PROGRAM MANAGEMENT INTEGRATION OFFICE AND THE SPACE SHUTTLE PROGRAM INTEGRATION

Approved By: Approved By:

/s/Arthur Bond   6/14/95   /s/David C. Schultz 5/24/95
Arthur Bond   David C. Schultz
Manager,   Manager,
ISSP Configuration Management Office   SSP Management Integration Office

/s/R. Dittemore   5/24/95
Ronald D. Dittemore
Manager,
Space Shuttle Program Integration

T.1 INTRODUCTION

This Memorandum of Understanding (MOU) is subordinate to the Memorandum of Agreement (MOA) between the International Space Station Program and the Space Shuttle Program.

T.1.1 PURPOSE

The purpose of this MOU is to define the Configuration Management (CM) process interfaces for the International Space Station Program (ISSP) and Space Shuttle Program (SSP). This process will be used to pre–coordinate, submit, evaluate, review, disposition, distribute, and close–out changes originated by either program that affect the joint program baseline documents.

T.1.2 SCOPE

This MOU shall apply to the ISSP and SSP configuration management process interfaces.

T.1.3 OBJECTIVE

The objective of this MOU is to assure that error–free changes are incorporated on schedule into the ISSP and the SSP joint baseline documents or baseline documents of either program. In order to minimize the occurrence of unnecessary and/or no value added changes, this MOU requires that proposed changes be pre–coordinated prior to entering proposed changes into either Program's formal change process.

T.2 JOINT CHANGE PROCESS

The SSP CM office will provide the support necessary to conduct the Joint Program Requirements Control Board (JPRCB) and Joint Mission Integration Control Board (JMICB). This support includes initial processing and distribution of Change Requests (CR) and evaluations, agenda development and distribution, meeting support, recording of joint board decisions and actions, preparation and distribution of JPRCB Directives (JPRCBDs) and JMICB Directives (JMICBDs), action tracking, and the maintenance of official joint change files.

T.2.1 JOINT PROGRAM REQUIREMENTS CONTROL BOARD (JPRCB)

The JPRCB shall authorize baselining of and changes to the joint SSP/ISSP baseline documents. The JPRCB shall control the joint SSP/ISSP MOA or any other joint document changes not delegated to the JMICB as shown in the MOA between the International Space Station Program and the Space Shuttle Program.

Changes affecting the joint baseline documents or baseline documents of either the SSP or ISSP and not delegated to the JMICB will be processed as follows:

a. Pre–coordination and technical review of proposed changes in a joint IPT.

b. Submission to the JPRCB member for authorization to evaluate and process in the system. If disapproved or consensus not reached by an IPT, the proposed change may be submitted by either program as an appeal route.

c. Evaluation by the respective program elements: An evaluation is required by the ISSP for Outside the Board (OSB) changes. Formal evaluation includes development of Rough Order of Magnitude (ROM) or Not to Exceed (NTE) cost estimates.

d. Review, disposition, and authorization by the JPRCB Co–Chairs: Formal direction from the JPRCB and implementation into each Program's baseline including flowdown as necessary to each Program's prime contractor(s).

e. Distribution to the SSP and ISSP elements by SSP CM.

f. Action close–out.

T.2.1.1 PRE–COORDINATE CHANGE

a. Proposed changes will normally be drafted and considered by the joint IPT having technical cognizance of the requirements document which is proposed to be changed.

b. The initiating program will assure that proposed changes are coordinated for impacts with all affected elements of the SSP/ISSP technical and management community.

c. The joint IPT of primary responsibility will provide a recommendation on the technical merits of the proposed change prior to submission.

d. A formal Program Change Identification Number (PCIN) will be requested from and assigned by the SSP CMO, or a formal Preliminary Change Memo (PCM) number will be requested from and assigned by the ISSP CMO. The team initiating the proposed change will document the change on a CR or PCM utilized by the Program that has maintenance responsibility for the affected joint document.

T.2.1.2 CHANGE SUBMITTAL

Change submittal includes data collection, data coordination, data entry, and change approval.

a. The SSP team member will draft the CR, if the change is against any SSP controlled document and the ISSP member will draft the PCM if the change is against any ISSP controlled document.

b. The CR/PCM will indicate any IPT or representative of the other program which have coordinated or need to coordinate on a change.

c. Submit the change to the appropriate JPRCB member for signature and entry into the system for formal evaluation.

d. Both SSP and ISSP CMO will not normally forward to the other program formal CRs/PCMs lacking documented evidence of pre–coordination and technical review by a joint IPT Chair

such as the signature of the responsible IPT Chair/Co–Chairs. Authorized signature lists shall be kept by the SSP and ISSP CMO logistics for verification of signatures and change control. The ISSP CMO will provide a list to the SSP CMO of those individuals authorized to sign a CR/PCM.

e. Only those joint CRs/PCMs that have the proper authorization (signatures) will be processed.

f. Although standard change processing includes precoordination with and technical review by the IPT of primary responsibility, changes may be submitted by either program in parallel with this activity as directed by Program management due to schedule or other constraints.

T.2.1.3 EVALUATE CHANGE

The CR/PCM shall be distributed for formal evaluation within the originating program and shall be forwarded to the CM control desk of the other program. Distribution of formal change paper between the programs shall only occur via the SSP and ISSP CM logistics functions.

The SSP and ISSP CMO will coordinate and agree on a schedule for formal change evaluation and presentation to the JPRCB. Factors such as the urgency and complexity of a proposed change, as well as the necessity for consultation with one or more International Partners, shall be considered before schedule dates are assigned.

The nominal template for evaluation and presentation of a proposed change to the JPRCB will be four weeks after the originating program CM system has submitted the change to the other program CM system for evaluation.

If an International Partner is impacted by the proposed change, the nominal template will be 45 days. The CMOs agree to adjust these templates as necessary.

T.2.1.4 REVIEW CHANGE

The process for formal direction from the JPRCB and implementation into each program baseline is as follows:

a. The SSP CMO will coordinate the JPRCB agenda with ISSP CMO to determine the agenda and presenters. Each program responsible for a presentation will provide copies of presentation charts to the other program CMO 48 hours prior to the JPRCB meeting.

b. The publication of an agreed JPRCB agenda will be accomplished by SSP CMO utilizing the Personal Computer (PC) Baseline Accounting and Reporting System (BARS). The SSP CMO will provide any necessary software to facilitate the use of PC BARS by the ISSP CMO.

c. SSP CMO shall provide a JPRCBD documenting the disposition of the change. The JPRCBD shall identify both the SSP and ISSP change numbers.

d. SSP CMO shall provide to the ISSP CMO a copy of JPRCB mini–minutes and the SSP Executive Secretary's accompanying notes. The SSP CMO will maintain audio tapes of the JPRCB meetings and make them available to ISSP CMO upon request.

T.2.1.5 DISTRIBUTE AUTHORIZED CHANGE

The SSP CMO will perform documentation distribution and maintenance activities necessary to update and maintain joint baseline documentation in accordance with authorized JPRCBDs.

The SSP CMO and ISSP CMO will assure that direction and actions resulting from the JPRCB is documented on their respective change directives and distributed within the individual programs for implementation.

Distribution of the authorized joint change directive, JPRCBD, shall be done by the SSP CMO for the SSP elements and ISSP CMO for the ISSP elements.

T.2.1.6 CLOSE–OUT CHANGE ACTIONS

a. Each Program CMO shall be responsible for verification of implementation within the respective program baseline.

b. Issuance of the ISSP Space Station Change Directive (SSCD) shall constitute closure of actions assigned to the ISSP at the JPRCB unless the action stipulates returning to the JPRCB.

T.2.2 JOINT MISSION INTEGRATION CONTROL BOARD (JMICB)

The JMICB will be co–chaired by the SSP and ISSP and is delegated authority to initially baseline and disposition all proposed changes to requirements as stated in the ISSP/SSP MOA. Any JMICB CR which affects the program baseline of either program must be forwarded to the JPRCB for review and approval.

Changes in requirements which one program is proposing to its baseline but that will not be a change to a joint document can be presented at the JMICB for technical discussion between the two programs. Any part of the program baseline that applies to the ISSP to SSP interface in the cargo bay is delegated to the JMICB. However, any change which impacts SSP performance, budget, schedule, or risk must be brought to the JPRCB. The JMICB can act as a pre–screening board for items that have to be presented at the JPRCB.

T.2.2.1 CHANGE PRE–COORDINATION

a. Proposed changes will normally be drafted and considered by the joint IPT having technical cognizance of the requirements document which is proposed to be changed.

b. The initiating program will assure that proposed changes are coordinated for impacts with all affected elements of the SSP/ISSP technical and management community.

c. The joint IPT of primary responsibility will provide a recommendation on the technical merits of the proposed change prior to submission.

T.2.2.2 CHANGE SUBMISSION

a. An official PCIN will be requested from and assigned by the SSP CMO.

b. Both SSP and ISSP CM will not normally forward to the other program CRs lacking documented evidence of pre–coordination and technical review by a joint IPT Chair, such as the signature of the responsible IPT Chair/Co–Chairs.

c. The original CR will be sent to the SSP CMO for evaluation distribution. The SSP CMO will distribute CRs for evaluation to the SSP elements and one copy to the ISSP control desk.

T.2.2.3 CHANGE EVALUATION

a. The initiator of the CR will designate the mandatory evaluators for each CR. In addition to the mandatory evaluators, the SSP CMO will add the standard JMICB distribution.

b. The initiator or their designee will be responsible for collecting the evaluations from both programs. The initiator or their designee will determine the length of time allowed for evaluation and a date when the CR would be ready to presented at a JMICB.

T.2.2.4 CHANGE REQUEST DISPOSITION

a. The SSP CMO will provide a list of CRs that are ready for disposition at the next JMICB to both the SSP and ISSP Chairs. The time, date, and agenda will be coordinated with both Chairs.

b. The initiator and/or presenter will be responsible for providing presentation material to SSP CMO 24 hours in advance of the JMICB.

c. The CR will be signed by both Chairs indicating disposition.

T.2.2.5 CHANGE REQUEST DISTRIBUTION

a. The SSP CMO will maintain the official files of original CRs dispositioned by the JMICB.

b. The SSP CMO will perform documentation distribution and maintenance activities necessary to update and maintain joint documentation.

c. The SSP CMO will provide a copy of the dispositioned CRs to the ISSA Receipt Desk. The dispositioned CR will act as a directive to both programs to implement the requirements in the CR.

T.2.2.6 ACTION ITEM CLOSE–OUT

The SSP CMO will prepare minutes of the JMICB documenting the action items. The action items will be addressed at each JMICB and approval by both Chairs is necessary to close an action item.